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Aspects of Demographic and Epidemiological Transitions in Nepal

by

Juhee Vajracharya Suwal ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of *Doctor of Philosophy*

in

Demography

Department of *Sociology*

Edmonton, Alberta

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Dedication

I would like to dedicate this thesis to three important people in my life: first, to my teacher, a Buddhist nun (Agga Maha Ganthawasak Pandit) Ma Gunawati from Myanmar, who was ordained at the age of twelve, who lived and taught in Nepal for 31 years before going back to Myanmar, whose teachings and inspiration helped me survive even in the most adverse situations; second, to my only sibling Biju, a devoted and an extraordinary brother, who passed away in January 1999; and to my aunt Tirtha Kumari who provided unconditional love to me and who passed away a few years ago without my knowledge.

Aspects of Demographic and Epidemiological Transitions in Nepal

Abstract

This thesis deals with the complex interrelationship involving socio-economic modernization, demography, and epidemiology in Nepal. The analysis is done in two parts: one with macro level aggregate data on Nepal since 1952 and the other with micro level data using different statistical tools such as Logistic Regression, Cox Regression, Census Forward Survival Method, Net Migration Rates, and Correlation. The macro analysis shows Nepal entering the third stage of demographic and epidemiological transitions.

The micro section utilizes an empirical analysis of data from the census of Nepal for 1981 and 1991, Nepal Fertility, Family Planning, and Health Survey 1991, and Nepal Family Health Survey 1996. This part of the thesis examines the effects of various socio-economic, material, cultural, demographic, and health-care-related factors on different aspects of demography such as fertility behaviour, infant mortality, maternal mortality, and internal migration. A number of hypotheses relevant to the current literature are tested.

One of the major findings is that fertility of Nepalese women appears to be on a path of sustained decline, especially for urban women. However, there are still substantial variations in fertility behaviours on the basis of ethnicity. For example, women from the Tibeto-Burman linguistic groups are more autonomous and desire fewer children as compared to those who belong to the Indo-Aryan linguistic groups. A preference for sons is also indicated, with varying degree of preference for women in different ethnic groups.

The main factors that determine the survival or death of infants in Nepal are the urban/rural residence, parity of mother, immunization to babies, prenatal care, and ethnicity. Maternal deaths are higher during postpartum period than during pregnancy and childbirth. Maternal mortality is higher for younger mothers.

Demographic implications of massive internal migration of young people from the highlands to the lowlands and its consequences are discussed in detail. A number of recommendations are given to health experts, social scientists, and policy planners in the country on how to achieve the demographic and epidemiological goals. Some possible consequences of the complete demographic and epidemiological transitions in the near future are discussed and suggestions to deal with such situation are provided.

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I would like to extend my deepest gratitude to Dr. Frank Trovato, my supervisor, without whose guidance, inspiration, and encouragement this thesis would not have been completed. My sincere thanks go to Dr. Wayne McVey, my committee member, for his significant input into and suggestions for the thesis and for his extraordinary support. I am grateful to Dr. Christine Newburn-Cook of the Faculty of Nursing, my committee member, for her detailed comments and invaluable suggestions. My thanks also go to another committee member, Dr. Herb Northcott for his valued suggestions and ideas. I am indebted to Dr. Judith Golec, my committee member, for her valuable input and especially, for accepting our late invitation to be on the committee. I would like to pay my gratitude to Dr. M.V. George, the External Examiner of my thesis, whose thorough and most invaluable comments within a limited time period were very impressive and appreciated.

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I appreciate the cooperation and support provided to me by Dr. Ros Sydie (Chair of the Department of Sociology), Dr. Derek Sayer (former Chair of the Department of Sociology), Dr. George Pavlich (former Associate Chair of the Department of

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I am indebted to Dr. Mohan N. Shrestha of Bowling Green State University, USA, and his wife Vijaya for their love and support, and for providing me "migration maps" of Nepal. I also appreciate the help of Dr. Linda Ogilvie of the Faculty of Nursing, University of Alberta, for serving on my Candidacy Committee and for providing me with all the articles she had on Nepal. The help extended by Dr. Devendra Shrestha, a demographer and a friend from Nepal, and my nephew Sirish, are also highly appreciated. I would also like to thank all my friends in the department, in Kathmandu, and elsewhere for helping me in one way or the other. I greatly appreciate the help of Macro International Inc., Maryland, USA, for providing me with the Demographic Health Surveys 1991 and 1996 data on Nepal, and the latest report on 2001 Nepal Family Health Survey.

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Chapter I

Introduction

Rationale and Scope of this Study

This research deals with certain aspects of demographic and epidemiological development in Nepal, in the context of socio-economic modernization. It is an undeniable fact that modernization, demography, and epidemiology are interrelated. As a country becomes increasingly modernized fertility and mortality decline, the leading causes of death shift from the infectious/parasitic to the chronic/degenerative types, and there is large-scale movement of people from rural to the urban areas. Socio-economic change also contributes to changes in the status of women in society. This research will elaborate on these and other related complex relationships involving socio-economic modernization, demographic, and epidemiological change in Nepal.

There have not been many studies done on demographic and epidemiological transitions in Nepal. It has been only half a century since the country opened its door to the outside world. The country's demographic and epidemiological situations can now be studied and analysed with empirical evidence in the hope of providing ways to improve its current demographic and health conditions. The dearth of research on the demographic and epidemiological situation in Nepal is also a motivating factor in conducting this study.

Modernization and Demographic and Epidemiological Transition

Modernization theorists assume that developing societies will eventually acquire the characteristics of the developed societies: low mortality (particularly low infant and child mortality); high level of urbanisation, education, standard of living; work opportunities and freedom for women; with high cost of child-rearing, high degree of social mobility, striving for achievement, nuclear families, and widespread use of modern methods of contraception (Andorka, 1978). The first step towards socio-economic modernization in Nepal began with the introduction of formal schooling, following victory over the 104-year-old struggle with the Rana regime in the early 1950s. However, education could not penetrate as easily into the rural sector of the country because of the geographical barriers and hierarchical disparities within the Hindu caste system. The traditional ways of living, which people have been practising for centuries, still prevail in this mostly rural country. The varied normative and belief system among the different cultural groups in the country makes it even harder to implement a uniform development policy.

The idea of modernization or so-called Westernisation has been criticized once it became obvious that the western modernization models applied to the Third World development have failed to produce many success stories (Bongartz, 1993). Social scientists have been looking at the problems of less developed countries from a different perspective. It is generally acknowledged that the demographic experience of Western countries in the 19th and 20th centuries is not directly transferable to the less developed countries. Also, many developing countries have been experiencing delayed epidemiological transition; therefore, this study aims to evaluate Nepal's epidemiological and demographic experience.

Since Nepal is a nation caught between modernization and tradition, it may not be easy to predict the exact timing of these transitions. For instance, it has been difficult to foresee the recent emergence of new diseases such as HIV/AIDS and re-emergence of some of the infectious and parasitic diseases such as malaria and tuberculosis in Nepal and elsewhere in recent years. The decline in fertility also plays an important role in the process of epidemiological transition. Knowing the onset of the transition is not always possible. According to the threshold hypothesis developed in the early sixties, certain economic and social "thresholds" (measured by life expectancy, literacy, and urbanisation) must be attained in order to bring fertility down from traditionally high levels (Culright and Hargens, 1984). Some social scientists (Abernethy, 1993) have rejected this explanation. Furthermore, in spite of a huge investment of research funds over more than three decades, social scientists could not agree with a common economic, social, and cultural threshold level for a fertility transition.

Omran (1971) proposed that the shifts in health and disease patterns that characterize the epidemiological transition are closely associated with the demographic and socio-economic transition that constitute the modernization complex. Similarly, the sudden mortality transition in the world after the Second World War was attributed to two general causes: rising standards of living brought on by socio-economic development, and advanced medical technology (Balfour, 1956). Omran (1971) argued that socio-economic improvements contributed in mortality transition in the case of the developed countries, whereas in the case of developing countries, modern public health programmes initiated by western aid have played a determining role. Contrary to this thesis, a dramatic fall in the death rate occurred in Nepal before the country had established international relations and before health programmes were introduced. Social scientists and health experts considered Nepal as a case study of how lower mortality is possible with relatively modest health services (Taylor and Taylor, 1976).

Another important situation has occurred in Nepal recently. Following four decades of sustained high fertility, the country is now undergoing a fertility transition. Caldwell (1998) found that it is doing so with absolutely no external pressure. For example, the government has not imposed any law regarding the number of children a family can have. And there has been no record of forced family planning during the campaigns. The current study will examine this phenomenon in some degree of detail.

The current health situation of the country is unsatisfactory. In fact, like other aspects of modernization, modern health facilities were introduced only in the 1950s. From a demographic and epidemiological perspective, modernization implies changes in infant, child, and maternal mortality, life expectancy, morbidity and fertility levels. In general, the prevalence of diseases reflects the health situation of the population, while mortality rate reflect both incidence and prevalence of disease. The health and mortality conditions of the population are determined by lifestyle, socio-economic status, well-being, availability and utility of health facilities, sanitation, and also demographic shifts. The more modernized is a country, the better its social, economic, and health conditions (Olshansky and Ault, 1986). Infectious and parasitic diseases would recede as a consequence of improvements in lifestyle, sanitation, and medical technology. Accordingly, the conditional mortality risk would then shift predominantly to degenerative and man-made diseases (Olshansky and Ault, 1986). This process is also characterized by shifts in the age composition of the population (i.e. demographic ageing).

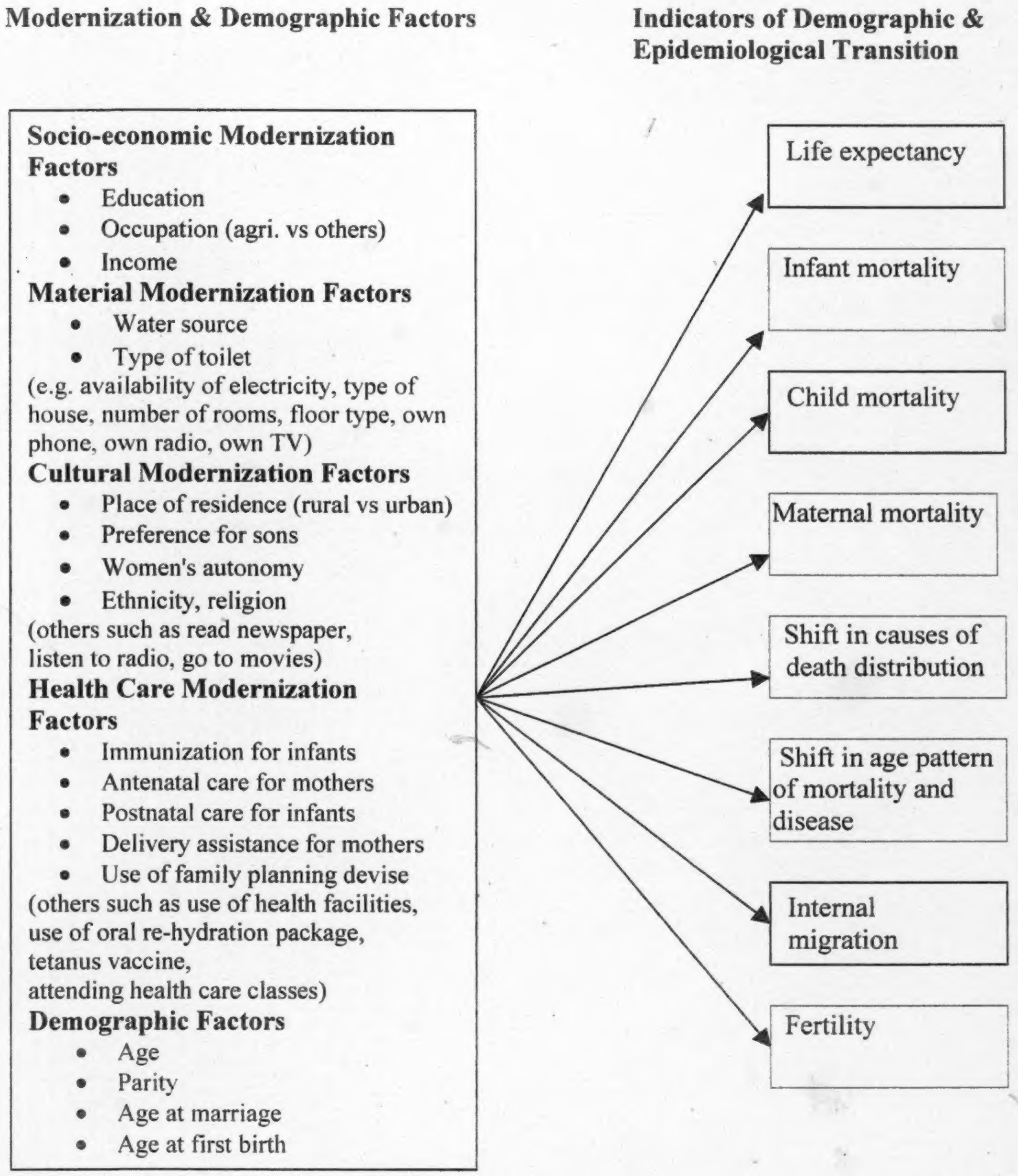
A General Model of Modernization and Demo-Epidemiological Change in Nepal

A conceptual model is developed to study the relationship of modernization factors to indicators of demographic and epidemiological transition stages in Nepal (Figure 1.1). The purpose of the model is to conceptualise how socio-economic, material, cultural, and health care modernization factors relate to demographic and epidemiological variables: life expectancy, infant mortality, child mortality, maternal mortality, shift in causes of death, shift in age pattern of mortality and disease, migration, and fertility of the Nepalese population. Although this model will not be tested directly, its main purpose is to provide a general organising framework to help place the thesis into proper perspective. In this thesis, only some aspects of the model can be tested empirically. For example, how the modernization and demographic factors would affect infant mortality, maternal mortality, internal migration, and fertility behaviour as shown by the arrows. Nevertheless, the indicators themselves are related with one another, in that, decline in infant, child, and maternal mortality will increase life expectancy; declines in infant and child mortality may lower fertility (as children could be expected to survive to be adults); on the other hand, lower fertility may increase the chances of survival of infants and children through increased time (care) and money spent ("quality" time spent on just a limited number of children), and through women's improved health due to infrequent childbearing. Similarly, high or low fertility, consequently, large or small family size may influence internal migration. Again, people's moving from rural to urban areas may improve infant and child mortality. Also, shift in cause of death distribution and in age pattern of mortality and disease also impact life expectancy. The effects of different modernization factors on various demographic components that are also the indicators of stage of epidemiological transition will be analysed and discussed in detail separately in different chapters.

Modernization factors would tend to be highly correlated with one another. For instance, more educated people may also have well-paying jobs as compared to people in agricultural occupations, and consequently, will earn more income than less educated persons. In the same manner, urban residence and income are likely highly correlated: wealthy people are more prone to live in urban areas and to also have telephones, TVs, modern houses with clean water and modern toilets. At the socio-psychological level, greater personal awareness of health issues and preventative measures among the more educated would dampen fatalistic values and attitudes, thus, giving way to their greater use of health facilities, the reading of newspapers, listening to radios, going to movies, and greater openness to new experiences (Inkles and Smith, 1974). Such interrelated factors may have a number of direct and indirect influences on demographic and epidemiological factors. For example, as socio-economic conditions improve, people's overall health will also improve. Under such conditions, there will be reductions in mortality probabilities, as well as a shift in the major causes of death from infectious to chronic conditions. Lowered mortality increases life expectancy as well as infant and child survival. In such contexts, overall fertility would also decline.

Figure 1.1

A Conceptual Framework Linking Modernization and Demographic Factors to Indicators of Demographic and Epidemiological Transition


Modernization & Demographic Factors
Indicators of Demographic & Epidemiological Transition
Socio-economic Modernization Factors
• Education
• Occupation (agri. vs others)
• Income
Material Modernization Factors
• Water source
• Type of toilet
(e.g. availability of electricity, type of house, number of rooms, floor type, own phone, own radio, own TV)
Cultural Modernization Factors
• Place of residence (rural vs urban)
• Preference for sons
• Women's autonomy
• Ethnicity, religion
(others such as read newspaper, listen to radio, go to movies)
Health Care Modernization Factors
• Immunization for infants
• Antenatal care for mothers
• Postnatal care for infants
• Delivery assistance for mothers
• Use of family planning devise
(others such as use of health facilities, use of oral re-hydration package, tetanus vaccine, attending health care classes)
Demographic Factors
• Age
• Parity
• Age at marriage
• Age at first birth
Life expectancy
Infant mortality
Child mortality
Maternal mortality
Shift in causes of death distribution
Shift in age pattern of mortality and disease
Internal migration
Fertility

Note: The bulleted variables are included in the empirical analysis.

Among the modernization factors, mothers' education is the one that has been studied and analysed most often for its impact on child mortality. A change of mothers' education from primary to secondary level is found to be twice as important in predicting child survival as that of having only primary schooling, based on data from ten developing countries (Caldwell and McDonald, 1981, cited in Ware, 1992). In one rural area of Nepal, even primary education (as opposed to no education) changed the attitude and behaviour of women in attending antenatal-care visits, from 44% women with no education to 90% with primary education seeking antenatal care (United Mission to Nepal, 1993a). Caldwell (1992) found that even a little improvement in mother's education raised child survival in developing countries. According to Caldwell, the difference in child survival for women with primary education compared to illiterate women was, perhaps, "the experience or fact of schooling rather than its content or what was learnt" at school (Caldwell, 1992: 213).

The impact of formal schooling of women on positive health behaviours is documented in one study done in Nepal (Joshi, 1994) and on increased use of health services by another (Niraula, 1994). Utilisation of health services was found to depend not only on the education level of women but also on extent of interaction with outsiders, rural/urban status and caste hierarchy of the patient and the health care provider, distance to health care centre, absence/availability of care provider and arrogant behaviour of health centre staff (Niraula, 1994). Educated women were also more economically independent (Ware, 1992). As well, the consequent lowering of child mortality and of infectious diseases allowed women to engage more in economic activity, which in turn enhance the health of their children.

Morbidity among children in developing countries varies by socio-economic condition. For instance, prevalence of childhood diarrhoea varies with housing conditions and parental education (Freij and Wall, 1979, cited in Black, 1992). In Bangladesh, diarrhoea is more prevalent among children from low-income families (Black, 1992).

Mosley and Chen (1983) have developed a model to show how five sets of proximate determinants on infant and childhood health, namely maternal factors, environmental contamination, nutrient deficiency, injury, and personal illness control directly influence the risk of morbidity and mortality (Mosley and Chen, 1992). The influence of these proximate determinants on morbidity and mortality was clearly shown from the data collected over 15 years (from 1978 to 1993) by a health project in the Asrang village development committee of Lalitpur district of Nepal (United Mission to Nepal, 1993b). During this period infant mortality rate was found to decline from 65 to 38 per 1000 live-births together with a significant improvement in the nutrition level of children as a result of an integrated health and development programme consisting of adult literacy, sustainable agro-forestry, clean drinking water and income generating activities along with the preventative measures provided by maternal child health clinics and health posts.

As Caldwell (1998) has argued, Nepal is distinctly two nations because of its unfavourable topographic condition: there are the areas that are easily accessible and thus, have development facilities, and there are areas that are inaccessible and remote. It is in the more isolated areas that children are generally valued by parents as economic assets because "there are still gains to be made from having large families" (Caldwell, 1998: 6). Because parents in such areas have little to offer to their children (in other words, parents are unable to invest on children's wellbeing and education), the wealth-flow is directed from the children to the parents. Indeed in Nepal, children, particularly girls, are often perceived as wage earners, helpers in family chores, and as baby-sitters for younger siblings (Nag et al., 1978).

In urban areas, the situation may be different. Children may or may not be considered as production agents. Few gains, if at all, are expected from children by urban parents. Due to the high cost of living, parents incur many expenses for their children. Moreover, as there is no provision of work for teenagers and young adults (earning by teenagers is considered un-prestigious by urban parents and high status families from both rural and urban areas), and as men and women look for jobs only after completion of their education, in urban areas the wealth-flow is usually from the parents towards their children.

Of course, children are still wanted by both rich and poor families; voluntary childlessness is unthinkable in Nepal. There is great importance on maintaining the family lineage. Sons play a major role during funeral rites and ceremonies that pay homage to the dead parents. Sons are therefore preferred to daughters by most ethnic groups in Nepal. Nonetheless, it is also true that daughters play important roles during funeral rituals and yearly "paying homage" ceremonies among some ethnic groups such as the Newars (the aboriginal people of the Kathmandu Valley). The view that girls bring "joy" to the family and girl's important role during religious ceremonies have been cited by various authors (Schuler and Goldstein, 1986; Karki, 1988). Although, Nag et al. (1978) have documented the economic value of children in Nepal, others (Schuler and

Goldstein, 1986; Karki, 1988; Niraula, 1995) have reported that children, especially sons, are wanted by parents not for economic reasons but for reasons of "continuation of lineage" and "for old age security."

For four decades Nepal's total fertility (TFR) remained stubbornly stagnant at about 6.0. Recently, however, Nepal has been experiencing sustained declines in fertility (current TFR is 4.1 children per woman on average) (Central Bureau of Statistics, 2002b). This decline is possibly related to the process of modernization. Many people are now perceiving children as economic burden (Kipp, 1995; Fricke, 1997), especially in the urban areas. Widespread assimilation of rural migrants into the urban areas is also a factor. As will be seen later, fertility decline has been more precipitous in urban areas than in the rural sectors.

Both overall and infant mortality, have been declining over the past five decades. Consequently, life expectancy at birth has doubled, reaching 54 years in 1991 (Central Bureau of Statistics, 2000a) and 59.7 in 2001(Central Bureau of Statistics, 2002). The ageing of the population is increasing steadily (Central Bureau of Statistics, 1995). The district-wise data show a promising outcome in this regard, with 18 out of 75 districts reaching up to 70 years of life expectancy, Kathmandu and Morang districts reaching above 70 years (Appendix 1.1). Nevertheless, because of high maternal mortality and high female childhood mortality, life expectancy of females in Nepal is a few years lower than that of males (Central Bureau of Statistics, 1995).

Due to economic necessity, many Nepalese people are migrating from the mountains and hills to the flat-land Terai region in the south, and from rural to semi-urban and urban areas. The intensity of movement is very high in the recent decades. As a part of the modernization process, such internal migration would bring significant demographic and social change in Nepal. Migration, whether internal or international, brings change in population composition of a country directly and also indirectly through other demographic components such as fertility. First and foremost, as the socio-economic condition of migrants improves in the new place, the health of children and adults improves, resulting in lower mortality levels. This may have two opposing implications: First, because of better survival probabilities of infants and children, fertility may decline. Second, with improved health and nutrition, women's fecundity may also improve, and thus, fertility may increase. On the other hand, as a result of assimilation process in urban culture, and with job opportunities and other new learning opportunities for women, the fertility of migrant women may decline significantly. Among the different types of internal migration, the most frequent in Nepal is the seasonal kind. It is the male members of the family who migrate seasonally in search of seasonal labour, for pasturing mountain animals, and to look after the land and crop they own in the Terai. Such long absences from their spouses contribute to reduced fertility. Thus, internal migration, no doubt, plays a role in fertility reduction.

The disease pattern of the country has been changing. The pattern shifted from the epidemic diseases such as plague, cholera, and smallpox as the main "killers" in the beginning of the last century, to non-epidemic infectious types of diseases such as typhoid, tuberculosis, malaria and diarrhoea, in the mid-century. Later, it shifted to a predominance of respiratory and circulatory diseases in the third quarter of the twentieth century, followed by a rise in man made diseases such as various "skin diseases" ("skin diseases" ranked number one in the morbidity list) during the 1980s and 1990s. Very recently, cancer took fourth place among all the causes of death, with heart diseases, accidental deaths, and suicide being others among the top ten causes of death (Table 3.2).

HIV/AIDS is becoming a serious concern, largely as a result of the ongoing trafficking of Nepalese girls to brothels in Indian cities such as Bombay and Delhi and of men who work as seasonal or short-term employees in India and other countries. A large number of HIV/AIDS cases may have been unreported because of the nature of the disease (reported deaths from AIDS/STD in 2001 census was 345, Table 3.2). Such diseases, and other health and healthcare-related factors affect mortality and life expectancy directly. They may also affect fertility and internal migration. High infant and childhood mortality tends to support high fertility value in a population; and people may choose to migrate to places where there are more health care facilities.

In the early 1980s, about 30 percent of all deaths in the world for children under age 5 was attributed to four diseases: neonatal tetanus, pertussis, measles, and ARI (Acute Respiratory Infection) (Foster, 1992). According to the World Health Organisation (1982), about 39 percent of all neonatal deaths in Nepal was due to tetanus (Foster, 1992, Table 1). Among other causes of death, nearly 5 million children in the developing countries die every year from diarrhoea (Snyder and Merson, 1982, cited in Black, 1992). One third of all childhood deaths in Nepal is caused by diarrhoea (UNICEF, 1996). According to the estimate of the Ministry of Health in Nepal, about 30,000 to 40,000 children under 5 years die every year as a result of pneumonia alone or the illness combined with diarrhoeal diseases (UNICEF, 1996). However, the census of 2001 does not support this estimate (Table 3.2).

The high maternal mortality and infant mortality of Nepal are often linked to the low availability and utilisation of health services, the poor health and nutritional status of expecting mothers, inadequate birthing practices, and early, closely spaced and repeated pregnancies (UNICEF, 1996). Among the health care related indicators, trained delivery assistance was found to be a strong predictor of maternal mortality levels in a study done with data from 64 countries (Shiffman, 2000). It is not surprising that in Nepal where 80 percent of childbirth still takes place at home, maternal mortality is as high as 535 per 100,000 live-births. It is yet to be seen how the modernization process in Nepal is associated with a shift in disease patterns from infectious to degenerative, declining mortality, improved life expectancy, and lower fertility.

Furthermore, there are other factors such as cultural practices of various ethnic populations of Nepal, which may affect the demographic transition of the country, mediated through fertility behaviour and family planning practices. The diverse ethnic groups and their cultural practices, thus, may have an indirect effect on the epidemiological transition of Nepal. There are several cultural factors that may affect morbidity and mortality. For instance, in Kenya, where girls bring bride-price to the parents, child mortality is slightly lower for females than for males while in some parts of South Asia including Southern Nepal where parents have to pay dowry to the groom party, male children survive more than females (Mott, 1979; Proffenberger, 1981, cited in Mosley and Chen, 1992). Certain cultural practices have shown positive impact on the survival of infants in Nepal. For example, infants from Newar ethnic background, in which specific prenatal and postnatal traditions prevail for the well-being of mothers and infants, were found to have higher survival probability than those from Brahmin-Chhetri families (Suwal, 2001). Besides cultural factors, political and climatic factors also play a big role in the mortality situation of Nepal. The Rana regime of 104 years prior to 1951, which discouraged development including establishment of schools and hospitals certainly had direct and indirect adverse effects on health and mortality of Nepalese people. As for the effects of climate, the death rate was found to be higher for infants and children of rural Nepal during monsoon season as was their physical under-growth (children's growth such as weight and height lower than as expected by their age) (Panter-Brick, 1996).

Traditional Cultural Practices and Health in Nepal

Traditionally, Nepalese rely on home remedy, herbal treatment, faith healers, and traditional birth attendants. Home remedy includes spices, plants, edible flowers, massage, and foods for different ailments. Foods are normally categorised as "hot food," (meaning heat or energy generating food) "cold food," "heavy food," "light food" and so on. Light food including liquid food or semi-liquid food and boiled water is given to sick people. Certain types of food are prohibited during specific ailments. There are different food combinations that are given to people with specific illnesses. As all the spices, including garlic and ginger, have medicinal value in the Eastern theory of diet, during illness and injuries, they have been used by many Nepalese even today.

Herbs are used for medicinal purposes in the households. And the Vaidyas (herbal doctors) have been treating Nepalese with herbal medicine for centuries. Faith healers are found all over the country, estimated in the late 1970s at 400,000 to 800,000 in number (Shrestha and Lediard, 1980). The practices and methods of faith healing (treatment) are different depending on the localities and ethnicity in which people belong to. Among the hill dwellers and the Terai origin people, faith healers generally act as mediums between spirits and patients. In the Kathmandu Valley, among the Newars, many faith healers treat patients with herbal medicine along with faith-healing. Many of them also read patients' zodiac documents (a person's life history from birth till death, written according to his/her timing and day of birth) and treat the patients according to necessity, as written in the zodiac. Many Newar faith healers are women who are either mediums between a patient and a God/Goddess (medium between a patient and spirits) or God/Goddess themselves when they possess the spirit of a deity.

Traditional birth attendants are females and are found throughout the country (Levitt, 1993). These women not only help during childbirth but also give advice during pregnancy.

Apart from these, there are other traditional practices that are directly related to health and well-being of Nepalese people. For instance, washing hands before and after eating, rinsing the mouth and using tooth picks after eating; drying washed utensils, dishes, and clothes in the sun; using ash for washing the dishes (when and where soaps are not available); and most importantly, not sharing eating plates and drinking glasses (bottles) (which may have many health benefits if someone has an infectious disease that is yet to be diagnosed). In most families, cups and plates used by a sick person are usually washed and kept separately from others. Normal eating habits of Nepalese such as eating at the same hour everyday, eating hot and freshly cooked food, taking lentils (rich in protein) and curry (rich in vitamins) with rice may have helped maintain their health. Nepalese also eat many greens that are not eaten in North America along with many varieties of vegetables where available. The greens such as garlic greens, mustard greens, greens from turnip, radish, pumpkin, zucchini, edible plants and flowers, most of which are not eaten in North America, are nevertheless, nutritious. Vegetables are dried and preserved for use during off-season. Drying meat and pickling vegetables are also popular.

Among other traditional practices, breastfeeding is one that is universal in Nepal and which is beneficial for the well-being of infants. Breastfeeding has also been practised as a mode to space children or to prevent pregnancy. Serving food first to children and elderly in the family is another cultural practice that may be beneficial to these sections of population.

Practices in other health friendly cultures include giving boiled water to sick people, especially to those who have colds or cough, and giving boiled and cooled water as drinking water to sick people. Such drinking water is also given to women in postpartum period among the Newars. Oil massage to the elderly (in most ethnic groups) and oil massage to infants and mothers in postpartum period (among the Newars) may have many health benefits such as strengthening of the muscles, blood circulation, and relaxation.

A particular practice of the Hindus of Nepal, which may sound conservative or orthodox but beneficial to men and women, especially to daughters-in-law in the joint family, is the restriction to women during menstrual period. In Hindu culture, menstruating women are considered polluted and are not allowed to cook food, eat with other family members, touch water used at home, and touch men. These women need to sit and sleep separately. They also need to clean themselves everyday (shower or bathe) in Brahmin families or at least on the fourth day of period in most other Hindu families. On the fourth day, they also need to wash all the clothes, bed covers, mattress covers etc., that were being used during the period. Such cultures give daughters-in-law a break from her usual heavy household chores and thus, can rest and relax during the uncomfortable period, especially for those who have to go through a painful period. Most importantly, if a girl has some kind of disease that is contagious and spreads through blood, such restrictions could be advantageous to other family members. Other traditions such as not allowing married daughters to do household chores while visiting their natal home for a couple of days is also good for women who normally may not have time to relax at her husband's home.

Besides herbal treatment and traditional practices that have health benefits, there are Chinese traditional treatments and Japanese *Jorei* that have been helpful in the well-being of Nepalese people. The Japanese *Jorei*, a traditional treatment done only with the spiritual ray of Meishu-sama (the founder of the way to Jorei) radiated through the palm of the hand, without any medication has been spreading slowly to many semi-urban areas of Nepal (The Kenko Shinbun, 1989).

The practices discussed may have worked as life saving devices to the Nepalese even in the absence of adequate medical facilities in the country. One should not overlook these health friendly traditions. Another way to help Nepalese in terms of health could be to train all traditional birth attendants and faith healers by medical personnel for a scientific treatment because these two groups are very influential in the rural areas. Because of the friendly way of dealing with the patients and because of familiarity, rural people prefer to seek help from faith-healers rather than medical personnel.

This was a brief explanation of how modernization factors, demographic components and epidemiological changes interact in Nepal. The preceding discussion also gave some background on Nepal's current situation with respect to its demographic and health conditions. The plan of the thesis is as follows: Chapter II and III bring forward macro data on Nepal's demographic and epidemiological situations. Chapters IV through VIII present various related features, though on a micro level of analysis. Specifically, chapter two looks at the demographic situation of Nepal in relation to the demographic transition. Like the European case, the Nepalese transition is believed to have started with the decline in mortality. The mortality transition was experienced all over the world by the beginning of the twentieth century. Conversely, fertility transition occurred much later. The fertility transition has started only recently in some developing countries and has not been able to reach yet to other countries. Rapid mortality decline along with a delay in the fertility transition explains population explosion in the world. Nepal is no exception. Fertility transition was noticed in Nepal beginning in 1991, coming down steadily thereafter, whereas mortality has been declining since the post-World War II period. The historical demographic transition for the world and Nepal will be discussed in this chapter.

Chapter three examines the different stages of epidemiological transition, globally and in Nepal: various kinds of diseases have attacked the world at different times. Beginning from the hunger and malnutrition crises in ancient times, to the epidemic diseases of the last century, and the more recent scourges of chronic and degenerative ailments affecting the world.

Development and modernization are said to have significant roles in the transition of disease patterns, from infectious to chronic diseases. The pattern of diseases prevailing in Nepal has been changing since a century ago. Apart from other factors, the pattern is also different for various parts of the country according to the altitude and climate of specific areas. Therefore, this chapter will contain a discussion of health and development in Nepal. This section will unveil what kind of hindrances of health development are faced by the people of Nepal and how people from different background view such a development.

The fertility behaviour of Nepalese women is explored in the fourth chapter. Fertility depends on many socio-economic, demographic, health-related, culture-related, and emotional factors, as well as on the decisions of a couple. These are reflected in the birth intervals. Using Cox regression method, the Nepal Fertility, Family Planning and Health Survey, 1991 data are analysed to study the three consecutive birth intervals. The findings suggest that the fertility decisions are influenced by women's place of residence, age, occupation, husband's occupation, and the age of onset of sexual relationship with their husbands. Education of women shows significant influence on their reproductive lives. Different orders of birth are found to have different levels of importance, and a preference for sons is also indicated. A careful analysis of the length of different birth intervals within the selected factors reveals that in many cases, fertility behaviour of Nepalese women is on its path to decline.

The fifth chapter concerns itself with the relationship of female autonomy and fertility. Autonomy of women may have a significant influence on fertility because it enhances women's freedom to assert their preferences, to socialise with outsiders, to come in contact with different media, to work outside the home, and to earn money. Although fertility of Nepalese women is still largely governed by traditional norms (for example, husband's desires), increased autonomy would likely imply a smaller family size. As women's autonomy varies among the different ethnic groups in Nepal, their role in fertility decision may also vary. A detailed study on different cultures of Nepal and their effect on fertility is presented in this section of the thesis.

"Determinants of infant mortality" is the focus of chapter six. Infant mortality has reached a low stable rate in developed countries while it is still high and on a slow decline in developing countries. There are many factors that contribute to the incidence of a high or low level of infant mortality. Although credit for contribution to the lowering of infant mortality has been given to health programmes by public health personnel and to the improvement in socio-economic status by social scientists, in a traditional and agricultural country such as Nepal, both these factors are found to influence infant mortality. Data on infant mortality obtained by the 1991 Nepal Fertility, Family Planning, and Health Survey are analysed in this study. Logistic regression model is used for analysing the data. Several hypotheses based on the country's background and previous literature are tested. The various reasons for the persistence of high infant mortality and the difficulties in lowering it are discussed. The findings suggest that among all the variables analysed in the study, parity, place of residence, immunization, and ethnicity influence infant mortality the most.

Maternal mortality is analysed in chapter seven. Maternal mortality has, recently, been recognised as a public health problem in the developing countries. The situation of maternal mortality in Nepal remained unexplored and vague until the early 1990s. A few research questions on maternal mortality were included for the first time in the 1991 national level survey of Nepal Fertility, Family Planning, and Health Survey. Until then, maternal mortality was estimated by various individuals and institutions, for a few districts, rural areas, and hospitals. By using 1996 Nepal Family Health Survey data, this study discusses the maternal mortality situation in Nepal and analyses, with the help of Logistic regression, the factors that affect maternal mortality in Nepal. Almost 26 % of deaths of women in reproductive age is accountable to maternal causes. Ethnicity, age of women, and parity are found to be the strong predictors of maternal deaths. A number of recommendations for policy implications are provided to help improve women's health and consequently to lower maternal mortality.

Chapter eight discusses internal migration in Nepal and its effect on demographic change. Due to data limitations, only age and geographic region are included in the analysis. After the unification of the country in 1769, a noticeable internal migration started to take place in Nepal. A significant internal migration started after the 1950s when malaria was controlled, land settlement programme was launched, north to south highways were built, and industries were developed in the lowland Terai plains. However, until the 1970s, internal migration was slow in Nepal. In recent decades, with an increasing population pressure in the hills, people began to move at a faster rate towards the Terai. This section investigates the motivations of the hills people to migrate and the consequences of such a migration. By using the 1981 and 1991 census data for

Nepal, net migration and rate of net migration during the ten-year period are computed for different age groups for all three regions (mountains, hills, and the Terai) of the country so as to measure the intensity and direction of migration, and to assess which groups of population are more vulnerable to migration. Based on the findings, the mechanisms to control highland to lowland migration are discussed and some valuable are recommendations are discussed.

The last chapter discusses the findings of the study and where Nepal is now situated with respect to its demographic and epidemiological transitions. The future of health, demographic and epidemiological conditions is also explored. As indicated earlier, the analysis is based on both aggregate and micro level data (censuses of 1981 and 1991, Nepal Fertility, Family Planning, and Health Survey 1991, and Nepal Family Health Survey 1996). Survey data for the year 1991 will be used for the analysis of fertility behaviour (Chapter IV) and infant mortality (Chapter VI). Selection of year 1991 data may have many advantages, one of which is that the results enable to compare some of the census findings because 1991 also happens to be a (decennial) census year in Nepal. However, to analyse the impacts of different variables on maternal mortality, the survey data 1996 will to be used because of a limited number of questions included in the 1991 survey. On the other hand, inclusion of analysis of data for both survey years allows this study to have a broader perspective on the changes, especially in women's attitudes and behaviours within the five-year period. Even though five-year is not a long period, comparative analysis could be done to some extent to see whether the variables such as "place of residence," "ethnicity," "religion," and "preference for a son" have similar or changed influence on mortality and fertility in Nepal within this short interval.

Details regarding data, measurement, and analytical methods will be included in each chapter.

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Appendix 1.1: Socioeconomic and Health Indicators for Districts of Nepal, 1996

District	Area	Pop. '000	Children <5 years ('000)		Pop. 60+ ('000)		Sex-ratio	Pop. den. per sq. km.^{a}	Pop Gr^b	Literacy		IMR^c	Life Exp.^{d}	Doc - Pop Ratio	VHW Ratio	Pop with safe drink water %	CPR^e	Urb Pop^f	Index of Dev.^{g}
			M	F	M	F	F/M			M	F							%	
1 Taplejung	3,648	120.1	8.8	8.7	4.1	4.0	95	32.9	0.06	62.4	30.6	91	60-65	60	2.4	53.7	19.7	-	55
2 Panchthar	1,241	175.2	1.4	1.3	5.2	5.4	97	141.2	1.31	61.7	26.9	83	60-65	43	4.3	36.8	14.7	-	52
3 Ilam	1,703	229.2	16.9	16.6	6.1	5.7	101	134.6	2.51	65.9	39.0	47	60-65	75	4.5	44.0	36.8	5.6	62
4 Jhapa	1,606	593.7	3.7	3.6	15.1	13.7	102	369.7	2.13	67.8	44.5	85	60-65	35	11	47.3	38.2	9.5	73
5 Sankhuwasaba	3,480	141.9	10.1	10.0	4.7	5.0	96	40.7	0.92	65.4	32.6	90	60-65	35	3.9	42.0	22.2	-	59
6 Bhojpur	1,507	198.8	13.9	13.8	7.0	7.2	93	131.9	0.31	58.9	26.3	58	65-70	39	3.1	30.3	10.5	-	48
7 Terhathum	679	102.9	7.5	7.1	3.5	3.9	95	151.5	1.07	74.9	37.6	72	60-65	34	3.2	56.0	20.2	-	68
8 Dhankuta	891	146.4	10.2	9.9	4.8	4.9	97	164.3	1.20	66.3	33.5	60	65-70	29	3.7	80.0	21.2	11.7	70
9 Morang	1,855	674.8	44.8	43.4	16.8	16.5	103	363.8	2.33	62.2	35.2	45	70+	12	8.4	45.7	39.0	19.2	65
10.Sunsari	1,257	463.5	32.9	31.7	11.5	11.9	102	368.7	2.96	59.1	60.2	77	60-65	93	7.6	57.6	26.1	18.3	61
11 Solukhumbu	3,312	97.2	7.2	7.2	2.7	3.0	97	29.3	0.97	56.8	21.5	89	60-65	24	2.8	57.3	14.4	-	42
12 Okhaldhunga	1,074	139.5	10.4	9.9	5.1	5.1	95	129.8	0.13	56.2	23.1	59	65-70	69	2.5	52.2	12.1	-	41
13 Khotang	1,591	215.9	16.8	16.0	7.2	7.1	94	135.7	0.16	58.4	23.6	87	60-65	54	2.8	43.4	6.6	-	46
14 Udayapur	2,063	221.2	17.1	16.8	5.8	6.1	98	107.2	3.25	55.2	21.5	74	60-65	55	4.7	20.7	19.5	-	36
15 Saptari	1,363	465.7	33.6	32.4	12.6	12.9	103	341.6	2.06	51.4	17.8	63	65-70	26	3.9	52.3	21.6	5.2	30
16 Siraha	1,118	460.7	34.2	32.3	12.4	13.2	105	387.8	2.05	43.5	13.3	66	65-70	66	4.0	46.5	21.5	4.1	18
17 Dolakha	2,191	173.2	12.8	12.4	5.8	6.5	96	79.1	1.40	53.1	17.7	64	65-70	58	3.1	57.8	19.9	-	24
18 Ramechhap	1,546	188.1	13.9	13.7	6.5	7.2	93	121.6	1.53	49.3	12.9	57	65-70	63	3.4	48.3	14.7	-	19
19 Sindhuli	2,491	223.9	16.9	16.7	6.1	6.4	99	89.9	1.98	48.6	17.7	80	60-65	56	4.1	27.9	25.8	-	22
20 Dhanusha	1,180	543.7	40.6	38.5	14.6	15.6	107	460.7	2.28	43.1	16.1	68	65-70	17	4.8	63.3	23.7	10.1	27
21 Mahottari	1,002	440.1	32.2	30.4	11.8	13.2	107	439.3	1.98	37.3	13.9	68	65-70	88	5.6	98.2	21.8	4.1	17
22 Sarlahi	1,259	492.8	36.4	35.2	13.4	13.8	107	291.4	2.12	38.0	13.5	66	65-70	82	4.8	79.6	24.4	2.9	28
23 Chitawan	2,218	354.5	25.6	24.5	10.3	9.7	98	159.8	3.11	65.7	40.9	82	60-65	12	7.9	32.8	35.0	15.4	66
24 Makawanpur	2,426	314.6	24.7	24.4	8.8	7.9	103	129.7	2.56	52.1	24.7	94	55-60	35	6.1	37.1	26.9	17.1	35
25 Parsa	1,353	372.5	28.9	27.7	9.6	8.8	108	275.3	2.28	46.2	17.9	74	60-65	9.5	3.7	70.2	17.4	18.5	34
26 Bara	1,190	415.7	32.5	30.5	11.7	10.6	107	349.3	2.70	41.7	13.7	47	60-65	83	4.1	59.6	23.0	4.5	29
27 Rautahat	1,126	414.0	28.8	28.2	13.5	13.3	107	367.7	2.19	34.7	11.9	73	60-65	82	4.1	52.4	17.1	-	14
28 Rasuwa	1,544	36.7	26.2	25.4	1.4	1.2	107	23.8	1.95	33.8	11.3	112	55-60	18	2.0	78.5	17.6	-	23

Appendix 1.1 (continued)

District	Area	Pop. '000	Children <5 '000		Pop. 60+ '000		Sex-ratio	Pop. Den.	Pop Gr	Literacy		IMR	Life Exp.	Doc-Pop Ratio	VHW Ratio	% of Pop WithSafe Drink Water	CPR	Urb pop.	Index of Dev.
			M	F	M	F	F/M			M	F								
29 Nuwakot	1,121	245.3	18.9	18.3	8.3	7.9	99	218.8	1.89	45.4	18.0	94	55-60	41	3.7	38.1	23.4	7.6	37
30 Dhading	1,926	278.1	20.9	20.5	10.1	9.2	98	144.4	1.33	46.2	18.5	119	50-55	69	5.6	28.7	12.6	-	39
31 Kathmandu	395	675.3	35.8	34.4	18.2	18.9	108	1707	4.70	82.2	57.0	34	70+	2.7	3.9	59.8	57.0	62.4	75
32 Lalitpur	385	257.1	14.2	13.7	7.9	7.8	103	669.7	3.32	76.5	48.0	51	65-70	17	3.4	60.9	56.1	45.1	72
33 Bhaktapur	119	172.9	11.3	10.8	5.4	5.2	100	1454	0.79	74.8	42.7	80	60-65	7.8	5.3	50.2	50.0	35.5	67
34 Sindhupalchok	2,542	261.0	19.2	18.3	9.7	9.4	101	102.7	1.16	44.1	15.0	91	60-65	52	3.3	60.7	19.8	-	21
35 Kavre	1,396	324.3	24.2	23.4	19.5	10.2	97	232.3	0.54	56.2	23.7	64	65-70	162	3.2	47.4	24.3	6.9	33
36 Manang	2,246	5.4	.254	.253	.22	.27	108	2.4	2.69	54.9	30.1	123	50-55	2.6	4.5	97.8	13.0	-	74
37 Gorkha	3,610	252.5	18.4	17.5	10.4	9.7	92	69.9	0.80	57.4	31.0	100	55-60	84	3.6	47.0	19.8	-	53
38 Lamjung	1,692	153.7	10.6	9.8	6.6	6.7	90	90.8	0.06	62.0	34.0	79	60-65	38	2.5	76.0	17.7	-	60
39 Kaski	2,017	292.9	20.2	19.4	9.8	10.6	93	145.2	2.81	71.0	44.5	68	65-70	57	4.2	85.1	35.6	32.5	71
40 Tanahu	1,546	268.1	19.6	19.2	9.5	9.6	90	173.4	1.82	66.5	36.2	66	65-70	67	5.3	41.5	20.8	-	57
41 Syangja	1,164	293.5	22.7	21.6	11.4	11.7	86	252.2	0.77	66.9	38.4	77	60-65	98	4.3	40.4	24.5	-	64
42 Mustang	3,573	14.3	.827	.842	.49	.59	109	4.0	1.00	60.8	34.8	32	50-55	7.1	8.9	98.0	24.2	-	69
43 Myagdi	2,297	100.6	7.4	7.2	3.8	3.9	90	43.8	0.37	55.0	26.1	75	60-65	50	2.5	89.7	25.9	-	58
44 Baglung	1,784	232.5	18.3	17.7	8.4	7.9	87	130.3	0.77	57.3	27.5	77	60-65	29	3.7	37.1	24.3	-	51
45 Parbat	494	143.5	10.5	10.2	5.5	5.6	86	290.6	1.12	68.5	38.1	79	60-65	48	2.6	67.1	24.7	-	63
46 Nawalparasi	2,162	436.2	32.6	31.9	13.3	12.2	99	281.8	3.45	53.3	25.2	100	55-60	87	5.7	74.7	27.9	-	47
47 Palpa	1,373	236.3	19.1	19.3	8.4	8.0	87	172.1	0.97	63.9	34.9	99	55-60	47	3.4	57.5	25.0	5.8	54
48 Rupandehi	1,360	522.2	37.0	37.0	16.8	14.4	103	284.0	3.20	53.2	26.2	68	65-70	14	6.3	86.8	22.4	16.0	50
49 Kapilvastu	1,738	371.8	27.5	27.0	12.6	11.1	106	214.0	3.20	41.1	15.5	103	55-60	53	4.6	82.8	6.9	4.6	31
50 Arghakhan	1,193	180.9	15.7	15.2	6.3	5.8	87	151.6	1.40	59.5	29.7	84	60-65	60	4.4	46.8	15.9	-	40
51 Gulmi	1,149	266.3	21.5	21.6	10.2	9.8	83	231.8	1.12	64.6	32.7	95	55-60	44	3.4	56.6	15.6	-	49
52 Dang	2,955	354.4	28.6	28.5	7.6	6.9	98	119.9	2.85	55.8	24.4	129	50-55	39	6.2	63.3	26.2	8.2	45
53 Pyuthan	1,309	175.5	15.3	15.2	5.3	5.4	87	134.0	1.07	51.4	17.0	103	55-60	35	3.6	61.7	10.1	-	25
54 Rolpa	1,879	179.6	14.5	14.5	5.0	4.8	92	95.6	0.66	46.6	10.2	123	50-55	179	3.5	53.3	8.2	-	12
55 Salyan	1,462	181.8	15.2	14.9	3.6	3.3	98	124.3	1.78	47.5	12.5	134	50-55	45	3.8	47.8	9.6	-	16
56 Rukum	2,877	155.6	13.1	13.1	3.6	3.2	98	54.1	1.61	46.8	11.3	131	50-55	77	3.6	73.8	10.1	-	9
57 Banke	2,337	285.6	21.9	21.5	7.7	6.6	107	122.2	3.30	46.4	21.8	69	65-70	9.2	5.2	89.6	27.8	16.7	44
58 Bardiya	2,025	290.3	22.7	22.4	6.7	5.7	102	143.4	3.77	41.6	16.8	96	55-60	58	8.5	87.5	21.9	-	38

Appendix 1.1 (continued)

District	Area	Pop. '000	Children <5 '000		Pop. 60+ '000		Sex-ratio	Pop. Den.	Pop Gr	Literacy		I M R	Life Exp.	Doc - Pop Ratio	V H W Ratio	% of Pop With Safe Drink Water	C P R	Urb Pop.	Index of Dev.
			M	F	M	F	F/M			M	F								
59 Surkhet	2,451	225.8	18.7	18.4	4.5	4.3	98	92.1	3.06	60.2	25.5	98	55-60	28	4.0	73.4	21.2	10.2	43
60 Dailekh	1,502	187.4	15.3	15.1	4.1	3.7	99	124.8	1.18	48.3	11.3	136	50-55	62	6.2	26.4	6.0	-	10
61 Jajarkot	2,230	113.9	9.4	9.6	2.4	1.6	101	57.1	1.38	38.0	9.0	163	<50	38	3.8	62.7	13.7	-	11
62 Jumla	2,531	75.9	6.3	6.2	1.5	1.0	103	30.0	0.99	41.5	8.5	130	50-55	25	2.5	36.9	12.9	-	7
63 Mugu	3,535	36.4	2.9	2.9	1.0	.78	104	10.3	1.84	37.0	5.2	201	<50	36	1.5	54.0	5.2	-	5
64 Kalikot	1,741	88.8	7.2	7.2	2.2	1.9	101	51.0	0.13	33.6	5.1	162	<50	89	2.9	51.7	5.0	-	3
65 Humla	5,655	34.4	2.6	2.6	1.0	.95	106	6.1	5.27	33.7	4.6	87	60-65	34	1.3	60.0	5.2	-	4
66 Dolpa	7,889	25.0	1.8	1.8	.55	.55	103	3.2	1.26	37.5	8.4	120	50-55	25	1.1	64.0	1.5	-	20
67 Kailali	3,235	417.9	35.7	34.9	8.9	8.3	101	129.2	4.83	45.3	15.1	115	50-55	22	8.7	86.1	17.0	10.7	32
68 Achham	1,680	198.2	16.4	16.0	5.5	6.2	89	118.0	0.68	45.3	5.5	115	50-55	66	4.2	70.0	6.2	-	1
69 Doti	2,025	167.2	12.8	12.8	4.1	4.7	93	82.6	0.88	48.7	9.9	119	50-55	33	3.1	69.9	9.1	7.4	6
70 Bajhang	3,422	139.1	10.7	10.8	4.0	4.0	92	40.6	1.15	50.1	7.0	163	<50	46	2.9	49.5	7.7	-	2
71 Bajura	2,188	92.0	7.7	7.8	2.4	2.2	96	42.0	2.00	43.4	7.7	172	<50	46	3.4	92.5	8.0	-	8
72 Kanchanpur	1,610	257.9	20.9	20.7	5.7	5.1	102	160.2	4.23	58.5	23.1	109	55-60	15	10.3	84.8	26.6	24.1	56
73 Dadeldhura	1,538	104.6	8.7	8.6	2.7	2.7	93	68.0	1.86	62.3	13.0	133	50-55	35	4.2	86.8	14.5	-	15
74 Baitadi	1,519	200.7	16.1	16.2	6.4	5.9	92	132.1	1.14	60.0	13.5	138	<50	50	2.9	46.0	9.7	-	13
75 Darchula	2,322	101.7	7.6	7.6	3.4	2.7	97	43.8	1.20	65.4	18.0	100	55-60	34	2.5	70.8	8.9	-	26
Nepal	147181	18491	14.9	14.4	5.9	5.7	99	126	2.1	54.4	25.0	93	54.6	16.7	4.6	57.6	23	9.2	-

Source: International Centre for Integrated Mountain Development (ICIMOD), 1997, and Research Centre for Primary Health Care (RECPHEC), 1997.

Note:
a. Population density per square kilometer. b. Population growth
c. Infant mortality rate d. Life expectancy
e. Contraceptive prevalence rate f. Urban population
g. Index of development, ranked as 1 to 75, 1 as the lowest and 75 as the highest
"-" indicates "data unavailable"
VHW denotes Village Health Worker and the ratio is 1: 1000
Doc. Pop. Ratio denotes Doctor Population Ratio, which is 1: 1000.

Appendix 1.2

Socio-Economic and Demographic Indicators for Nepal, 2001

Indicators	Census Year 2001
Area (sq. km.)	147,181
Mountains	35 %
Hills	42 %
Terai (flatland)	23 %
Population (in thousand)	
Total	23,151.4
Male	11,563.9
Female	11,587.5
Population growth rate (annual, %)	2.2
Ethnic groups	103
Languages spoken (excluding dialects)	93
Crude birth rate (per 1000)	32.5
Crude death rate (per 1000)	9.3
Total fertility rate (per woman)	4.1
Urban	2.1
Rural	4.4
Infant mortality rate (per 1000)	64.1
Maternal Mortality Ratio (per 100,000 live-births)	539**
Life expectancy (years)	
Total	59.7
Male	58*
Female	57*
Literacy rate (percent)	
Total	53.7
Male	65.1
Female	42.5
Unemployment rate (percent)	1.8
Urbanisation (percent)	15.9***

Source: Nepal in Figures, 2002, Central Bureau of Statistics, Nepal;
* Estimates of Population Reference Bureau Inc., 2002, Washington;
** This figure is for the survey year 1996, Nepal Family Health Survey, Ministry of Health, 1997;
*** Economic Survey, Fiscal Year 2001/2002, His Majesty's Government, Ministry of Finance, Nepal.

Chapter II

Demographic Transition in Nepal

Introduction

The demographic transition describes the shift of human population, from a stage of persisting high fertility and mortality, to one of low fertility and mortality. The transition is usually described as evolving over four stages: an initial stage with high birth and death rates, and natural increase of almost zero; a second stage is when birth and death rates decline, though mortality declines first, causing high rates of population growth; a third stage sees the birth rate decline, resulting in slowed population growth; in the last and the fourth stage, population growth is either very small or negative as a result of almost equal low birth and death rates (Heer, 1975).

The modern rise of the world's population has been attributed to the decline in mortality in the nineteenth and the twentieth centuries (McKeown, 1976; Preston, 1977). The high mortality rates of the seventeenth century began to decrease during the eighteenth century in a number of European countries (Kitagawa, 1977). The average expectation of life at birth in North and West Europe, North America and Oceania improved from 40 years in 1850 to 50 years in 1900, and to 70 years in 1950. The drop of overall mortality was mostly due to the decline in infant death rates and improvement in child and maternal mortality. In Asia, Africa, and Latin America, mortality began to decline only after 1900 (Kitagawa, 1977). The mortality decline in these areas was relatively slow until about 1940 and noticeably rapid after the World War II.

Prior to 1650, the average expectation of life at birth for the world was 25 years or less (Bogue, 1969). In pre-modern societies, although fertility may have been high, the extremely high mortality, from epidemics, wars and famines, ensured a slow rate of population growth (Omran, 1971). Populations at that time were young because of the combination of high fertility and low life expectancy.

The significant improvement in mortality in Europe during the eighteenth century resulted from the recession of plague and the beneficial effects of the Agricultural Revolution (Preston, 1977). In Razzell's (1969) view, however, smallpox may have accounted for as many as 20-25 percent of English deaths in 1700. Further, mortality declines resulted from improved living standards after the Agricultural Revolution, and later, after the Industrial Revolution (Preston, 1977). There is an ongoing debate in the literature about the contribution of socio-economic development, medical facilities, and public health programmes to mortality decline during the 19th century (Arriaga and Davis, 1969; Preston, 1975; Caldwell, 1979).

Heer (1975) speculates that the high death rates during the pre-Agricultural Revolution period were due to food scarcity that caused malnutrition and under-nourishment. This condition aggravated infectious diseases. In the meantime, introduction of new crops such as potato, maize, and tomatoes in Europe and Asia saved many lives in these areas. Columbus and other discoverers brought back plants and seeds from the New World, among which potato was introduced into Ireland around 1600, which became, by 1800, the main food staple of the Irish people (Heer, 1975). Indeed, potato consumption has been credited as a key factor in the Northern European population increase during the 18th and 19th centuries. For instance, between 1754 and

1846 the population of Ireland doubled and the Russian population increased three times between 1725 and 1858 (Heer, 1975). Davis (1986), however, has argued that initially, owing to increased reliance on starchy staples and increased density of settlement, mortality actually went up in these populations. It was only in the nineteenth century that the mortality in Europe and its settlements began to decline rapidly (Heer, 1975). The cause of this rapid mortality reduction is attributed to the improvement in nutrition level, sanitation, control of infectious diseases through inoculation and the use of antibiotics.

Death rates in the developing countries started to decline only after World War II. Their declines proceeded at a faster pace than they did in Europe or the United States (Heer, 1975). This is the main cause of rapid world population growth during recent decades (Bogue, 1969). It took many decades for the developed countries to invent life-saving devices and medicine (an outcome of modern technology), and then to achieve low mortality, whereas the developing countries have benefited by the acculturation of existing discoveries within a few decades (Bogue, 1969).

The gradual development of technology (medical and otherwise) during the past two centuries following the Industrial Revolution have brought significant advances in living standards for the North-Western European, North American and other populations of the world. Yet, Easterlin (1980) is sceptical about the contribution of modern technology; it brought a new source of instability in the economy, contributing to periodic depressions. On the other hand, Davis (1986) has theorised that industrialisation helped produce lower death rates through such factors as irrigation, improved plant breeding, machinery, transportation, and medical technology after 1850. Thus, the level of consumption was thought to have contributed to population increase at that time.

Many social scientists believe that the improvement in mortality during the last three centuries was because of the control of infectious diseases. McKeown (1978) has argued that the main reason for "the decline of the infections was increased resistance which resulted from better nutrition" (McKeown, 1978: 541). In his view, population increase, poor hygiene, and insufficient food aggravated infectious diseases during the first Agricultural Revolution, among which only nutritional food intake increased during the early stages of industrialisation. Preston (1977) believes that the noticeable improvement in mortality and consequent gain in life expectancy after 1880 was because of the development of the germ theory of disease.

Caldwell (1986) and Newland (1981) have given evidence for less developing countries such as Sri Lanka, China, and Kerala (a State in India) that GNP did not correlate with the expectancy of life at birth and mortality, especially infant mortality. Caldwell gave credit to the improvement in education and health as the determinants of low mortality in developing countries in the twentieth century. On the other hand, the relatively rapid mortality reduction in Latin America, Africa, and Asia in the mid-twentieth century was attributed to the use of antibiotics and malaria control (Stolnitz, 1955). The decline of death rate from 20.3 in 1946 to 14.3 in 1947 in Sri Lanka (Ceylon) was attributed to malaria control by a number of reports and research published in the 1950s (Fredericksen, 1968). Frederiksen (1968) has argued that the decline was due to the economic development that increased per capita food consumption arising from economic development.

Pre- and Post-Second World War Situations and Fertility Transition

The demographic transition from high to low birth and death rates was said to have occurred together with the transformation of European society from an agrarian to an industrial one and from a complex extended family type to the smaller nuclear family unit (Handwerker, 1980). Even in the period before World War II, the natural increase for the industrial nations was almost zero because of low mortality and fertility, thus, leaving little room for population growth. These countries are now in the fourth stage of demographic transition. Before the war, it was believed at that time that low fertility would not rise in the final stage of transition. This theory would be revised later when the birth rates of the United States and Canada rose during the "baby-boom" period, following the Second World War (Heer, 1975; McVey and Kalbach, 1995; Foot and Stoffman, 1996).

The Western fertility transition started during the mid to late 1980s in Western Europe. It has gradually spread in recent decades to the developing nations, where the decline has been quite rapid (Watkins, 1987). Heer (1975) has credited the fertility transition to an increase in demand for an educational labour force, the introduction of social security systems, and an increase in population density as causes of indirect effect of economic development on fertility. In general, urbanisation, level of education, lower infant and child mortality have been found to influence fertility reduction (Watkins, 1987). Handwerker (1980) believed that, among many other factors, fertility transition also reflected cultural transformation of societies.

Social scientists have not been able to specify the economic and social thresholds that societies must cross to ensure sustained fertility decline (Cleland, 1998). As evident from the history of demographic transition, a substantial reduction in mortality had preceded fertility decline in almost every developed society (Preston, 1978). In the mid-nineteenth century, a number of demographers had suggested that mortality reduction would lead to fertility decline based on the supposition that parents would need to produce fewer off-springs in order to fulfil a desired number of surviving children (Notestein, 1945; Davis, 1945; Freedman, 1963). Indeed, there is strong empirical evidence that infant mortality is among the strongest and the most consistent predictors of fertility levels in societies (Heer, 1966; Preston, 1978).

The Princeton study of the European fertility transition done in the late 1960s revealed that the previously accepted theory of mortality reduction preceding decline in fertility did not hold universally (Coale, 1969). In fact, researchers have found it difficult to come to a common conclusion in the assessment of the causal role of mortality in the European fertility transition (Coale, 1973; Mathiessen and McCann, 1978). According to the Princeton study, fertility transition appeared to precede mortality decline in France, while childhood mortality and fertility declines occurred simultaneously in England. On the other hand, fertility response came long after improved survival in Norway (Coale, 1969; Coale, 1973; Cleland, 1998).

The findings from Asian countries are also equivocal. For instance, the birth rates of Taiwan and Ceylon (Sri Lanka) between early to mid-twentieth century remained unaltered even after a substantial decline in death rates (Coale and Hoover, 1958). A similar trend was found in Nepal in later decades. Its fertility remained almost unchanged while its death rate has fallen from around 35 in the early 1950s, to 16.1 in 1987, with a substantial concomitant decline in infant mortality (United Nations, 1980; Central Bureau of Statistics, 1995). If breastfeeding is as important an intervening variable linking child mortality and fertility, as Knodel and van de Walle (1967) have postulated, fertility should have declined a long time ago in Nepal, where breastfeeding is universal and relatively prolonged. This theory of "breastfeeding acting as an intervening variable between child mortality and subsequent fertility" is based on the fact that breastfeeding is supposed to delay the return of ovulation and thus the next birth is delayed if the present child survives, in circumstances where no conscious contraception is employed (Preston, 1978).

Recent trends show that mortality and fertility levels in the developed countries have reached a minimum, whereas in many developing countries, although mortality has been falling steadily, fertility remains relatively high (though declining lately). This situation has not only created a population explosion but also contributes to raise internal migration rates within rapidly growing countries, as well as international migration and poverty. Also, as mortality conditions change and general health of the populations improve, the infectious diseases, which were the main cause of death in the past, are being replaced slowly by the degenerative and man-made diseases.

The Demographic Situation in Nepal

Population Trend

The practice of administrative counting of persons and houses has a long history in Nepal even before the country was unified in 1768. Counting of houses was practised in different areas of Nepal prior to the Lichchhavi Period (250 A. D.) (ESCAP/UN, 1980). The naming of places to denote the number of house-counts was popular before and after the conquest of the Kathmandu Valley and other principalities by King Prithvi Narayan Shah. For example, the Kingdom of Gorkha was known as *Barha-hazar Ghare* or "consisting of 12,000 houses" (ESCAP/UN, 1980). Long after this unification and the Anglo-Nepalese peace treaty in 1816 and subsequent demarcation of Nepal's boundary with India, Fraser (1820) estimated the population of Nepal around 1820 to be about 3,661,000 (Fraser, 1820 as cited in ESCAP/UN, 1980).

In the later half of the nineteenth century, the British estimated the population of Nepal in order to assess the potential market for their manufactured goods and the availability of eligible hill men for recruitment to the British Army. Nevertheless, the estimates of the Nepalese government and the British were conflicting at times. For example, in 1879 the population of Nepal was estimated as 2 million by the British government and 5 million by the Nepalese government (ESCAP/UN, 1980). In 1864, the then Prime Minister, Jung Bahadur Rana, attempted a complete enumeration but could not succeed because of transport and communication problems (United Nations, 1980). The first "census-like" population count was made in 1911 and then repeated approximately every 10 years until 1942 (Rayamajhi, 1957).

The census of 1952/54 was the first in Nepal that used internationally acceptable guidelines (Rayamajhi, 1957; United Nations, 1980; ESCAP/UN, 1980). This census had to be enumerated in parts: the eastern part of the country in 1952, and the western part in 1954, because of lack of transportation and communication facilities and lack of trained personnel (Rayamajhi, 1957; United Nations, 1980; ESCAP/UN, 1980). From 1961 onwards, census data have been collected every ten years.

Table 2.1

Population Trend of Nepal, 1911-2001

Year	Population	Growth rate per annum (%)
1911	5,638,749	-
1920	5,573,788	-0.13
1930	5,532,564	-0.07
1942	6,283,649	1.16
1952/54	8,473,478	2.30
1961	9,412,996	1.65
1971	11,555,983	2.07
1981	15,022,839	2.66
1991	18,491,097	2.08
2001	23,151,423	2.20

Source: a) Rayamajhi, 1957. The Population Census of Nepal.
b) Central Bureau of Statistics, Population Monograph of Nepal, 1995.
c) Central Bureau of Statistics, Nepal in Figures, 2002.

The censuses of Nepal prior to 1952/54 are said to be under-reported (Rayamajhi, 1957; United Nations, 1980; ESCAP/UN, 1980; Central Bureau of Statistics, 1995). The cause of under-enumeration in the 1920 census was thought to be due to the fact that the government during that time was primarily concerned about the number of slaves in the country, and thus, was not paying much attention to the actual head-count (United Nations, 1980). Similarly, the probable under-enumeration of 1930 census was attributed to the objective of the enumeration, which was to list the eligible males in the army, as there was a threat of war between Nepal and Tibet. The decline of population in 1920 was attributed to the loss of 20,000 Gurkha soldiers in World War I, as well as high mortality from influenza epidemic in 1917, and the under-enumeration in the 1920 census (United Nations, 1980).

The under-enumeration in the 1930 census was further indicated by the substantial increase in population during 1930-1942, in spite of the fact that the Great Earthquake of 1934 killed 8,591 Nepalese and a large number of Gurkha troops were recruited to fight in the Second World War. However, the unbelievably huge amount of population increase (2 millions) during 1942 and 1952/54 was probably due to the newly acquired democracy in the country, the return of soldiers from World War II and more importantly, due to the thorough and systematic enumeration procedure adopted in 1952/54. The high rates of population growth in the later censuses were the result of improved mortality and almost unchanged fertility.

Migration has been an important component in the process of population change in Nepal. There has been frequent seasonal migration to lowlands or to more fertile land within the country. As well, many people cross the border to Tibet (until China's invasion in 1959) for business purposes, and go to India for employment opportunities (including joining the Indian Army). Similarly, many Indians cross the open border to Nepal in search of employment. The number of immigrants to Nepal have increased from 234,039 in 1981 to 439,488 in 1991 of which 418,982 were from India (Gurung, 1998).

Table 2.2 shows the percentage distribution of population of Nepal by age and sex from 1952/54 to 1991. Although, the trend in population increase is not consistent, the

Table 2.2: Percentage Distribution of the Population of Nepal by Five-Year Age Group, 1952/54 to 1991

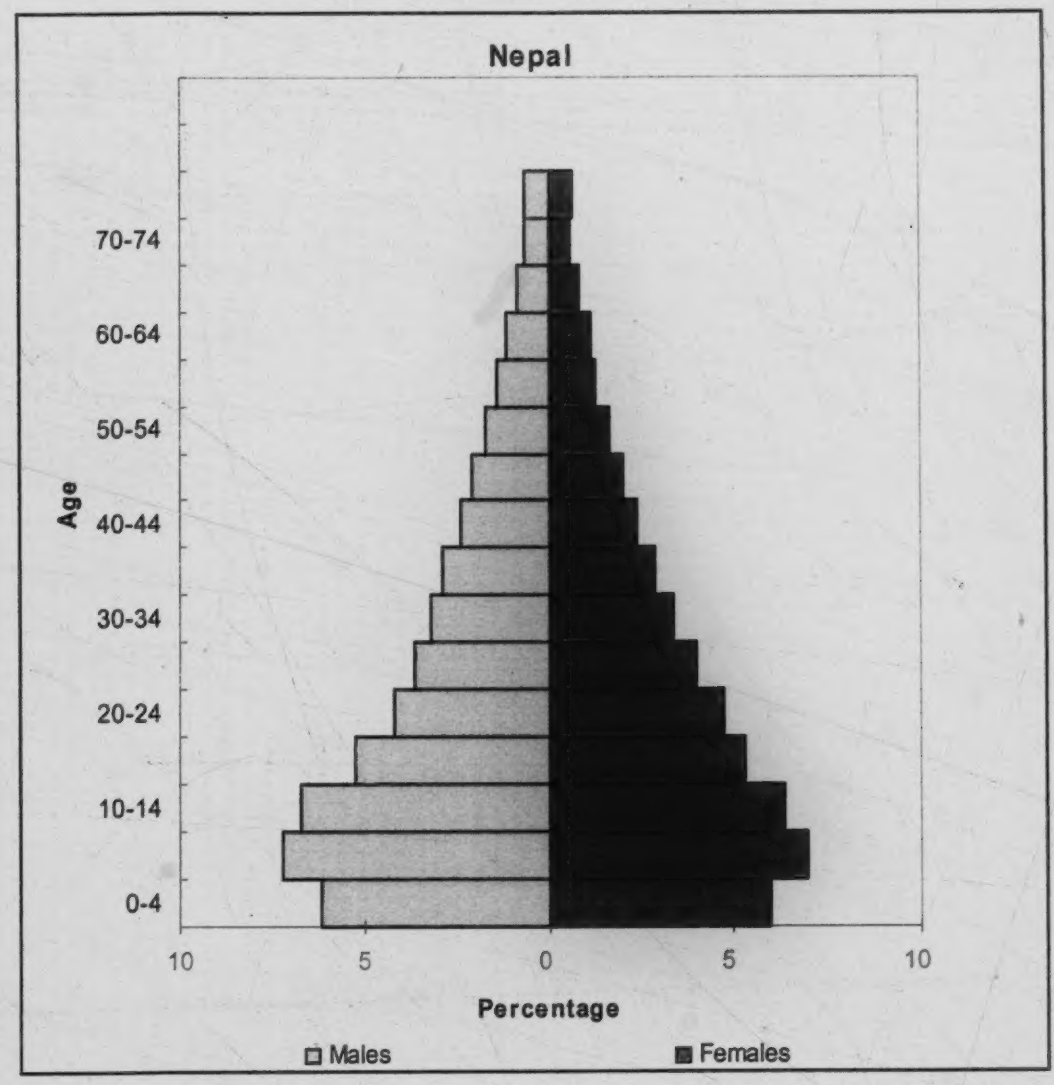
Age	1952/54			1961			1971			1981			1991		
group	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
0-4	13.3	13.1	13.2	14.2	14.2	14.2	13.6	14.7	14.1	15.5	15.3	15.4	14.9	14.4	14.7
5-9	14.3	13.4	13.9	14.8	14.0	14.4	15.2	14.9	15.1	14.5	14.6	14.6	15.5	14.8	15.1
10-14	12.3	10.4	11.3	12.2	10.4	11.3	12.1	10.4	11.2	11.9	10.8	11.4	13.1	12.1	12.6
15-19	9.9	9.4	9.6	8.8	8.4	8.6	9.4	8.7	9.1	9.0	8.6	8.8	9.5	9.9	9.7
20-24	8.4	9.3	8.8	7.9	8.8	8.4	8.0	8.8	8.4	8.3	9.5	8.9	7.9	9.3	8.6
25-29	8.3	9.0	8.7	8.3	8.9	8.6	7.8	8.3	8.1	7.4	8.1	7.8	7.0	7.8	7.4
30-34	7.0	7.5	7.2	7.2	7.8	7.5	6.6	7.4	7.0	6.1	6.9	6.5	6.0	6.5	6.3
35-39	6.2	6.0	6.1	6.4	6.0	6.2	6.6	6.2	6.4	6.0	5.9	6.0	5.6	5.5	5.6
40-44	5.1	5.6	5.4	4.8	5.2	5.0	5.2	5.4	5.3	4.9	5.1	5.0	4.5	4.7	4.6
45-49	4.3	4.1	4.2	4.2	4.0	4.1	4.2	3.8	4.0	4.3	3.9	4.1	4.1	3.9	4.0
50-54	3.7	3.8	3.8	3.7	3.9	3.8	3.5	3.4	3.5	3.8	3.4	3.6	3.3	3.1	3.2
55-59	2.4	2.3	2.3	2.4	2.4	2.4	2.3	2.2	2.2	2.4	2.2	2.3	2.7	2.3	2.5
60-64	2.0	2.6	2.3	2.2	2.7	2.5	2.4	2.7	2.5	2.5	2.4	2.5	2.3	2.3	2.3
65+	2.5	2.9	2.7	2.6	2.9	2.7	3.0	3.1	3.0	3.4	3.1	3.3	3.7	3.4	3.5
Age Unknown	0.3	0.6	0.5	0.2	0.4	0.3	-	-	-	-	-	-	-	-	-
All ages	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: Country Monograph Series No. 6, "Population of Nepal", ESCAP/UN, 1980;
Central Bureau of Statistics, Population Monograph of Nepal, Nepal, 1995.

Note: "-" indicates "data not available."

Figure 2.1

Population Pyramid of Nepal, 2001



percentage of under five populations seems to increase rather than decrease over the five decades, an evidence of persistent high fertility and declining mortality. The proportion of young age groups (up to age 19) shows similar trend. Interestingly enough, despite the high maternal mortality, the proportion of women in the age groups 20-44 is higher than that of men in all the census years. This may also reflect high out-migration of men (including seasonal migration to other countries, especially those that join the British Gurkha Army and the Indian Army). The proportion of girls aged 10-14 is substantially lower than that of boys in every census. One reason for this may be because girls of age 12-14 are given away in marriage (although child marriage is illegal by Nepalese Law) to Indian citizens, which is often the case in South Nepal. Early marriage of girls saves parents from the amount of dowry money *tilak* (given to the groom) in this part of the country. Another reason may be the practice of girl trafficking in this age group, to places such as Bombay. A noticeable change in the population distribution is the steady increase over time in the proportion of age 65 and over for both males and females.

The population pyramid of Nepal, 2001 (Figure 2.1) shows broad bottom and narrow top, depicting high fertility and mortality. Age 0-4 year group obviously depicts the recent fertility decline. Despite the high maternal mortality ratio of 539 per 100,000 live-births (Ministry of Health, 1997), female proportion is higher than male in the ages 15 through 44. This may be the outcome of short and long-term migration of young males to other countries for education and employment (especially, employment in Indian and British Armies). In spite of the fact that life expectancy at older ages is generally higher for females than males in Nepal (United Nations, 1996), the age-sex pyramid (Figure 2.1) shows higher proportion of males to females from age 45 onward. The return of retired men from foreign land and maternal mortality may, perhaps, have contributed to this high male proportion.

Mortality Trend

In the past, the census was the only source of mortality data for Nepal until the Demographic Sample Survey was started in 1974/75 (United Nations, 1980). The accuracy of mortality analysis has been hampered because of lack of a vital registration system. Vital registration data are available only for a few villages or a few headquarters of certain districts through health projects and non-governmental organisation programmes. Even in Kathmandu, because birth or death registrations are not compulsory, people seem to acquire birth certificates for their children only to get them admitted to elementary schools, if the school requires them.

A review of crude death rate trends (Table 2.3) reveals past and current health conditions in Nepal. The trend of these estimated rates is not stable for several reasons: first, the periods of estimation are inconsistent; second, some estimates are based on census data and others on different surveys; third, indirect method of estimation was used when data were taken from census because coverage of deaths has been poor in Nepalese censuses, similarly, direct data obtained from surveys are not free from sampling errors either (Central Bureau of Statistics, 1995).

The crude death rate was extremely high in Nepal up until a few decades ago. The reason for high death rate was attributed mainly to three factors: the topography of the country, inadequate health and medical facilities, and the low level of economic development (Vaidyanathan and Gaige, 1973). Over the years, crude death rate has been steadily declining, as a result of public health programmes and improving health of the population (United Nations, 1980). Malaria and smallpox eradication programmes were launched during 1950s and 1960s. By 1976, smallpox was completely eradicated and cholera was no longer a threat (ESCAP/UN, 1980). However, malnutrition, measles, tuberculosis, water-borne intestinal infections, and respiratory diseases continue to be a health hazard to the general population (United Nations, 1980; ESCAP/UN, 1980).

Progress in health facilities and implementation of different health-related programmes may have contributed to the further reduction of death rates between 1980 and 1990. On the other hand, the education level of the population, interaction with international agencies and different media, and the living standard have improved during those periods, which probably had both direct and indirect impacts on death rates. Furthermore, by that time, there have been a numerous national and international non-profit, non-governmental organisations that were actively engaged in health and education-related programmes, women development, awareness, sanitation, income generating and child survival programmes, especially focused on rural population. These programmes may also have contributed in the noted decline of death rates.

Table 2.3

Estimates of Crude Death Rates, Nepal, 1952-2001

Source	Period of Estimation	Crude Death Rates both sexes	males	females
United Nations, 1960	1952/54	30.0	-	-
Thakur, 1963	1953-1955	44.0	-	-
Vaidyanathan and Gaige, 1973	1954	36.7	-	-
United Nations, 1963	1955-1960	36.6	-	-
Central Bureau of Statistics, 1977	1953-1961	27.0	-	-
Gubhaju, 1975 (unsmoothed data)	1961	27.1	-	-
(smoothed data)		34.2	-	-
Krotki and Thakur, 1971	1961	33.0	-	-
Rama Rao and Kulkarni, 1969	1961	29.8	-	-
National Health Survey, 1969	1965-1966	27.0	-	-
United Nations, 1972	1965-1970	22.9	-	-
Central Bureau of Statistics, 1977	1961-1971	21.4	21.3	22.6
United States Bureau of the Census, 1979	1971	24.0	-	-
United Nations, 1972	1970-1975	20.3	-	-
Demographic Sample Survey, 1976	1974-1975	19.5	18.6	20.4
United States Bureau of the Census, 1979	1975	21.0	-	-
Demographic Sample Survey, 1977	1976	22.2	21.5	22.8
Demographic Sample Survey, 1978	1977-1978	17.1	17.9	16.2
Central Bureau of Statistics, 1985	1971-1981	13.5	12.2	14.9
New Era, 1986	1984	10.9	10.8	11.0
Demographic Sample Survey, 1987	1986-1987	16.1	-	-
Central Bureau of Statistics, 1991	1991	13.3	12.9	13.6
Central Bureau of Statistics, 2002	2001	9.3	-	-

Source: Country Monograph Series No. 6, Population of Nepal, pp 49,ESCAP/UN, 1980;
Central Bureau of Statistics, Population Monograph of Nepal, pp 96, 1995; and
Central Bureau of Statistics, Nepal in Figures, 2002.

Note: "-" indicates "data unavailable."

Life Expectancy at Birth

Life expectancy at birth, an indicator of health status and the level of mortality of a population, is increasing slowly in Nepal. It doubled within 30 years as shown in Table 2.4, from about 25 years in 1952 to about 50 years in 1981. The expectancy of life at birth was 59.7 in 2001 and the ascending trend is continuing. However, because of different sources of data, methods of estimation, and quality of estimation, the trend in life expectancy is uneven.

Except for the 1950s and a few other periods, the expectations of life at birth for females are lower than that for males. This situation contradicts data from developed countries and other developing countries (except for those in India in the 1970s and Bangladesh in the 1990s) (Hansluwka et al., 1982; Population Reference Bureau Inc., 1995). In Nepal, this probably reflects high maternal and female child mortality than male. Whether such a high female mortality is due to gender bias (preference for a male child) is an open question, though most studies (Fürer-Haimendorf, 1964; Jones and Jones, 1976; Goldstein, 1976; McDougal, 1979; Hitchcock, 1980; Fricke, 1986; Karki, 1988; Niraula, 1994; Allen, 1996) have not shown there is discrimination against female children in Nepal. And as for female infanticide, the term "infanticide" is unheard of in this country (Allen, 1996) except for very rare cases when girls abandon newborns on the roadside or any place if the pregnancy is out of non-marital relationship, an action taken to save the girls themselves from the embarrassing stigma in society.

Table 2.4

Estimated Expectation of Life at Birth by Sex for Nepal, 1952-2001

Source	Period/Year of Estimate	Expectation of Life at Birth	
		Males	Females
Central Bureau of Statistics	1952/54	25.6	25.7
Vaidyanathan and Gaige	1954	27.1	28.5
Central Bureau of Statistics	1953-61	35.2	37.4
Rama Rao and Kulkarni	1961	34.2	33.6
Krotki and Thakur	1961	30.2	33.0
United States Bureau of Census	1961	34.7	32.5
Gubhaju	1961-71	42.9	38.9
Central Bureau of Statistics	1961-71	37.0	39.9
Gubhaju	1971	42.1	40.0
SEARO (WHO)	1971	46.0	42.5
United States Bureau of the Census	1971	41.9	39.1
Demographic Sample Survey	1974-75	46.0	42.5
Demographic Sample Survey	1976	43.4	41.1
United States Bureau of the Census	1974-76	45.0	42.0
Central Bureau of Statistics	1971-81	46.3	44.3
Central Bureau of Statistics	1981	50.9	48.1
Central Bureau of Statistics	1983	51.8	50.3
Central Bureau of Statistics	1991	55.0	53.5
Central Bureau of Statistics	2001	58.0	57.0

Source: United Nations, ESCAP, pp 61, 1980,
Central Bureau of Statistics, Population Monograph of Nepal, pp 71, 1995, and
Central Bureau of Statistics, Nepal in Figures, 2002.

Child Mortality

Child mortality (death to children aged 1-5 years) has been a big threat to Nepal for a long time. Although, child mortality is declining rapidly and continues to decline steadily, it is still high (Tables 2.5 and 2.6). Diarrhoeal diseases is the number one cause of death of these children, Acute Respiratory Infections (ARI) being the number two cause (UNICEF, 1987; UNICEF/NPC, 1996). Table 2.5 and Table 2.6 provide past childhood mortality figures (along with other age-specific death rates) and more recent figures.

The two major health surveys (for years 1996 and 2001) of Nepal (Table 2.6) show that child mortality has declined for both rural and urban areas and also for both sexes. The figures for rural/urban residence depict a significantly narrowed rural-urban differential in the year 2001 (differential of 18.7 deaths), compared to year 1996 (differential of 30.7 deaths). Although, rural child mortality has not been able to decline to the urban level within the five-year period, the data within rural and within urban categories show rural mortality (differential of 17.8 deaths) declining much faster than the urban (differential of 5.8 deaths). This result is of significant value for Nepal where majority of population lives in rural area.

The male and female child mortality estimates show that both have improved over the years, with male mortality declining more than female. Female children died more than males in both the surveys. Also, the differential of female child mortality over male did not narrow down but rather increased over the five-year period.

Table 2.5

Adjusted Age-Specific Death Rates by Sex for 1974/75, 1976, 1977/78 and 1986/87 (From Demographic Sample Surveys) Nepal.

Age group	Males				Females			
	1974/75	1976	1977/78	1986/87	1974/75	1976	1977/78	1986/87
0	141.2	128.4	109.9	111.2	123.0	137.9	97.9	104.6
1-4	33.2	32.6	23.4	20.1	35.9	37.2	22.1	35.8
5-14	4.8	5.2	4.7	3.4	5.6	6.1	5.2	6.6
15-24	5.0	6.0	4.4	4.3	7.9	6.0	4.3	4.1
25-34	4.7	7.3	6.0	5.6	7.7	10.7	6.5	4.2
35-44	6.7	8.0	11.9	7.0	12.6	14.8	10.2	6.8
45-64	36.2	45.1	33.0	34.2	38.2	48.1	39.2	28.9
65+	98.3	134.5	116.7	82.1	120.8	108.1	102.3	99.1
All ages	18.6	21.5	17.9	15.8	20.4	22.8	16.2	17.0

Source: Central Bureau of Statistics, Population Monograph of Nepal, 1995.

Table 2.6

Child Mortality (age 1-5 years) by Place of Residence and Sex, Nepal, 1996 and 2001

Year	Child deaths (per 1000 births)					
	Rural	Urban	Differential	Male	Female	Differential
1996	53.2	22.5	30.7	45.5	56.5	11.0
2001	35.4	16.7	18.7	27.8	40.2	12.4
Differential	17.8	5.8		17.7	16.3	

Source: Ministry of Health, Nepal Family Health Survey, 1996, and
Ministry of Health, Nepal Demographic and Health Survey, 2001

Fertility Trend

Until the mid-1970s when Nepal started to conduct Demographic Sample Surveys and Fertility Surveys (as part of the World Fertility Survey) the country had to rely on decennial censuses for its fertility information. Prior to the 1971 census, demographers suspected under-reporting of births in previous censuses. Even the reports on sample surveys indicated errors in the data such as misreporting of age and date of birth, marital duration, date of the past events, and number of births, due to memory lapse (United Nations, 1980).

The crude birth rates of Nepal do not seem to decline remarkably during the 1952/54 and 1991 period. The reduction in birth rates appears to be very slow, thus enhancing population growth (because of steady decline in mortality). Also, because the estimates were computed with different data sources using various methods, they fluctuate considerably, resulting in an inconsistent trend. Table 2.7 gives a clear picture of crude birth rates for Nepal for forty years. The birth and death trends for Nepal (Figure 2.2) show that the country is still in the second stage of demographic transition, heading recently towards the third stage.

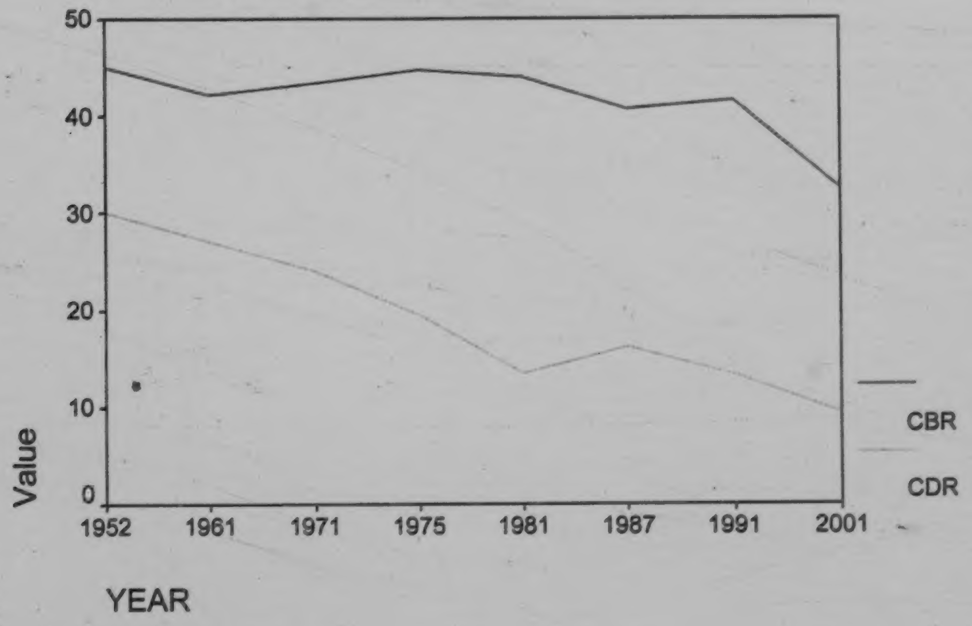
Age-Specific Fertility Rate (ASFR)

The age-specific fertility rates for the three decennial years 1971, 1981, and 1991 (Table 2.8) show that in recent year 1991, younger women (age groups 15-19 and 20-24) have higher fertility rates than in the past decades, the highest being in the age group 20-24 (286 births per 1000 women). But the rates are significantly lower in 1991 than in 1971 and 1981 for the older age groups, the lowest being for age 45-49 (28 births per

1000 women). The rural/urban differential depicts the fact that in 1981, urban women in younger age groups 15-19 and 20-24 have higher fertility rates than their rural sisters in the same age groups. The rates for urban women in the older age groups are lower than for those in rural areas. However, for the oldest age group 45-49, the rates are almost the same (97 births per 1000 rural women and 96 births per 1000 urban women). By 1991, fertility rates started to decline significantly after age 30 compared to 1981, with a tendency of getting lower as the age groups go higher for both rural as well as urban women. Nevertheless, urban women have significantly low fertility rates throughout all the age groups, noticeably from 30-34 age group onwards.

Figure 2.2

Trends in Birth and Death Rates in Nepal



Source: Table 2.3 and Table 2.7.

Table 2.7

Estimated Crude Birth Rates for Nepal, 1952-2001

Source	Period of Estimation	Crude Birth Rate
United Nations	1952/54	45.0
Vaidyanathan and Gaige	1954	48.7
Central Bureau of Statistics	1951-61	40.0
Krotki and Thakur	1961	47.0
Gubhaju	1961	42.1
United States Bureau of the Census	1961-66	44.6
Vital Registration Pilot Project	1968	42.0
Central Bureau of Statistics	1961-71	43.8
United States Bureau of the Census	1966-71	41.0
United States Bureau of the Census	1971	43.4
Karki	1971	42.4
Gubhaju	1971	42.4
Central Bureau of Statistics (adjusted)	1971	42.0
Demographic Sample Survey (adjusted)	1974-75	44.7
Demographic Sample Survey (adjusted)	1976	46.8
Nepal Fertility Survey (unadjusted)	1976	43.6
Nepal Fertility Survey (adjusted)	1976	45.5
Demographic Sample Survey (adjusted)	1977-78	42.6
Central Bureau of Statistics	1981	44.0
Karki	1981	44.9
Family Planning/Maternal & Child Health	1981	42.9
Demographic Sample Survey	1986	40.7
Central Bureau of Statistics	1991	41.6
Central Bureau of Statistics	2001	32.5

Source: United Nations, ESCAP, pp 61, 1980,
Central Bureau of Statistics, Population Monograph of Nepal, pp 71, 1995, and
Central Bureau of Statistics, Nepal in Figures, 2002.

Total Fertility Rate (TFR)

The total fertility rate for Nepal seems to have declined only since 1991 (TFR = 5.6) after remaining stagnant for more than four decades. Table 2.8 shows the TFR for 1971 and 1981 as 6.3. A group of demographers estimated the total fertility of Nepal for the years 1977 and 1991 based on the direct estimates from the Nepal Fertility, Family Planning, and Health Survey, 1991, and the Nepal Living Standards Survey (NLSS), 1996 data. Table 2.9 shows their estimated figures. Fertility transition is clearly seen, with total fertility dropping from 6.68 in 1977 to 4.78 in 1991, a decline of 1.90 children. The transition is more prominent in urban than in rural fertility, a drop from 6.10 in 1977 to 3.40 in 1991, a decline of 2.70 children as compared to a reduction from 6.65 in 1977 to 4.82 in 1991, a decline of 1.83 children in the rural areas.

The Nepal Family Health Survey, 1996 and the Nepal Demographic and Health Survey 2001 show further declines in total fertility, with significant declines in urban areas (difference of four children within 24 years). Moreover, the differential between rural and urban fertility was narrow in 1977 (difference of less than one child) whereas the differential is more than two children in 2001.

Table 2.8

Age Specific Fertility and Total Fertility for Nepal, 1971, 1981, and 1991.

Age Group				Rural		Urban	
	1971	1981	1991	1981	1991	1981	1991
15-19	0.074	0.066	0.095	0.079	0.096	0.091	0.082
20-24	0.267	0.230	0.286	0.246	0.292	0.254	0.224
25-29	0.310	0.266	0.272	0.274	0.279	0.254	0.187
30-34	0.261	0.245	0.212	0.249	0.220	0.208	0.111
35-39	0.196	0.206	0.151	0.210	0.160	0.156	0.062
40-44	0.109	0.142	0.077	0.131	0.083	0.093	0.026
45-49	0.043	0.099	0.028	0.097	0.029	0.096	0.012
TFR	6.3	6.3	5.6	6.4	5.8	5.8	3.5

Source: Central Bureau of Statistics, Population Monograph of Nepal, 1995.

Table 2.9

Decline in Total Fertility Rate, Nepal, 1977-2001.

Total Fertility Rate (TFR)	Year											
	1977			1991			1996			2001		
	total	rural	urban	total	rural	urban	total	rural	urban	total	rural	urban
TFR	6.68	6.65	6.10	4.78	4.82	3.40	4.64	4.83	2.85	4.10	4.40	2.10

Source: Nepal Family Health Survey, 1996,
Nepal Demographic and Health Survey, 2001, and
Estimates (for 1977 and 1991) by Dongol et al., 1997.

The desired family size or the mean ideal number of children also declined by 1981 onwards. The desired family size dropped from 4.0 children in 1976 and 1981 to 3.5 in 1986, to 3.1 in 1991, to 2.9 in 1996, and to 2.6 in 2001 (Thapa, 1989; Ministry of Health, 1993; Ministry of Health, 1997; Ministry of Health, 2002). The average number of children ever born (CEB) for "ever married women" in reproductive age was 2.5 in 1981 and 2.7 in 1991 (Table 2.10). Number of children decreased as women's education levels increased, implying education's negative effect on fertility.

The information on other South Asian countries (Table 2.11) shows Nepal's situation in the region. The country seems to have improved in its demographic situation compared to its past history but still struggling among the regional countries. It seems like Nepal needs to continue its endeavour towards improvement in demographic situations more rapidly, especially to compete with Sri Lanka.

Table 2.10

Average Number of Children Ever Born (CEB) per Ever Married Women 15-49 Years by Literacy Status and Educational Attainment, Nepal, 1981 and 1991.

Literacy Status and Educational Attainment	Average Number of Children Ever Born 1981	1991
All	2.5	2.7
Illiterate	2.5	2.8
Literate	2.1	1.9
No schooling	2.2	2.2
Primary (1-5)	2.2	1.9
Secondary (6-10)	1.9	1.7
SLC & equivalent	1.7	1.6
Intermediate & equivalent	1.6	1.4
Graduate & equivalent	1.4	1.5
Post-graduate & above	1.5	1.5
Others	-	1.6

Source: Central Bureau of Statistics, Population Monograph of Nepal, 1995.
Note: "-" indicates "not available"
SLC is the School Leaving Certificate, equivalent to Grade 10.
Intermediate is the two-year college programme after SLC
Graduate is the two-year Bachelor programme
Post-graduate is the two-year Masters programme

Table 2.11: Some Demographic Indicators for Selected South Asian Countries (SAARC* Countries), 2002.

Countries	Indicators										
	Population (million)	Pop. Density (pop. /sq. mile)	Birth rate	Death rate	Infant mortality rate	Total fertility rate	Life expectancy		% using** contraception		GNI
							Male	Female	All	Modern (methods)	US $
Bangladesh	133.6	2403	30	8	66	3.3	59	59	54	43	1,590
Bhutan	0.9	51	34	9	61	4.7	66	66	-	31	1,440
India	1049.5	827	26	9	68	3.2	62	64	48	43	2,340
Maldives	0.3	2426	23	4	37	3.4	67	66	18	-	4,240
Nepal	23.9	420	31	11	64	4.1	58	57	39	35	1,370
Pakistan	143.5	467	30	9	86	4.8	63	63	28	20	1,860
Sri Lanka	18.9	748	18	6	17	2.0	70	74	66	44	3,460

Source: Population Reference Bureau Inc., 2002. World Population Data Sheet.

Note: "-" indicates data unavailable,

* SAARC is the abbreviation for South Asian Association for Regional Co-operation

** this % is for married women of age 15-49

GNI denotes Gross National Per Capita Income

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Chapter III

Epidemiological Transition and Nepal

Introduction

The theory of epidemiological transition was developed as a supplementary to the demographic transition theory and to give a more comprehensive view of population dynamics (Omran, 1971). The epidemiological transition theory deals with the complex change in patterns of health and disease, and with the interactions between these patterns and their demographic, economic and sociologic determinants and consequences (Omran, 1971). Like the demographic transition itself, epidemiological transition evolves over different stages.

During the first stage, known as The Age of Pestilence and Famine, people die mostly from epidemics such as influenza, diarrhoea, smallpox and tuberculosis. The high death rate of infants and children keeps life expectancy somewhere between 20 and 40 years (Omran, 1971; Olshansky and Ault, 1986). In this stage, because of high mortality, the population may not increase even though fertility is high.

In the second stage, The Age of Receding Pandemics, rapid improvement in sanitation, standard of living, medical and public health programmes allow infants, children and women in the childbearing ages to survive into the middle and older ages. This change in death distribution increases life expectancy to about 50 years (Omran, 1971; Olshansky and Ault, 1986). However, fertility may not change drastically, which may result in high population growth (Omran, 1971). During The Age of Degenerative and Man-made Diseases stage, known as the third stage of epidemiological transition, mortality continues to decline and approaches a stable low level. The causes of death shift to chronic degenerative diseases such as heart disease, cancer, and stroke, which attack the older people more than the younger ones. The life expectancy at birth in this stage exceeds well above 50 years, as high as 70 years (Omran, 1971; Olshansky and Ault, 1986). The infant, child, and maternal mortality now remain very low. Due to low mortality rate and improvements in socio-economic wellbeing, fertility rate may decrease significantly in this stage.

Beginning in the 1960s, changes in life-style (e.g. less smoking, more exercise, and healthy diets) among the North Americans and the Europeans, coupled with medical advancement, brought about a decline in the death rates of older population, especially deaths from degenerative diseases. This shift of death distribution to the more advanced ages is also an indication of federal health care programmes in North America in the 1960s, which favoured the old over the young population. This recent fourth stage is known as The Age of Delayed Degenerative Diseases. In this stage both males and females in the advanced ages have rapidly declining death rates almost at the same pace, with life expectancy increasing to almost 80 years (Olshansky and Ault, 1986). Generally, fertility rates are low and in some cases below replacement level during this stage.

The developed countries are considered to be somewhere between the third stage and the fourth (Olshansky and Ault, 1986). Many developing countries still are somewhere between the second stage of transition, "The Age of Receding Pandemics" and the third "The Age of Degenerative and Man-Made Diseases." The important yet unexplored issue of where Nepal stands in the demographic and epidemiological transitions is an important feature of this study.

The Global Epidemiological Situation

Even though epidemiological transition occurred a long time ago in many parts of the world, especially in the developed countries, infectious and parasitic diseases are still the leading causes of death worldwide. More than one-fourth of all deaths (more than 17 million deaths) is due to this cause in 1995 (Olshansky et al., 1997). According to the WHO (1995) estimates, nearly 9 percent of all deaths worldwide is accountable to respiratory diseases such as pneumonia and influenza, which is also the sixth-ranked cause of death for the United States in 1994; 6 percent of all deaths around the world is attributed to diarrhoeal diseases, which include cholera, typhus, and gastroenteritis, another 6 percent due to tuberculosis and measles, 7 percent caused by other infectious and parasitic diseases such as malaria, dengue fever, neonatal tetanus, whooping cough, AIDS (acquired immune-deficiency syndrome), schistosomiasis (a water-related parasitic infection), and syphilis.

Although, both the developed and the developing countries are affected by infectious and parasitic diseases, an estimated 97 percent of deaths from this cause occur in the latter areas, with the highest percentages in the poorest countries (Olshansky et al., 1997). Among these diseases, just four (diarrhoeal diseases, measles, tuberculosis, and malaria) account for three-quarters of all years of life lost to infectious and parasitic diseases (Olshansky et al., 1997).

Looking back, however, after 1963, the first major problem that developed around the world was that of evolution of malaria-carrying mosquitoes resistant to DDT. Then on, the global incidence of malaria increased rapidly. Again in the late 1970s, when smallpox was eradicated from the world, health experts assumed that infectious and parasitic diseases could finally be conquered (Olshansky et al., 1997). Also, after the eradication of most infectious and parasitic diseases in Europe and the United States as a result of public health campaigns and improved living conditions, public health personnel expected death rates from such diseases to wane as countries develop economically and as international health campaigns reach greater proportions of the world's population (Olshansky et al., 1997).

They soon realised that conquering infectious and parasitic diseases is still far away from reality. Not only malaria but also other new forms of old diseases and some 'new' diseases such as AIDS (acquired immune-deficiency syndrome) emerged in less developed as well as industrialised countries. A new form of cholera killed thousands of people in Africa and Asia since 1995. Outbreaks of diphtheria in Laos, Thailand, and the United States, spreading of diphtheria epidemic in the Soviet Republics, and various forms of meningitis in some parts of Europe, North America, and West Africa are just a few examples of how premature it is to hope that infectious and parasitic diseases would be eradicated or at least conquered soon from the globe (Olshansky et al., 1997).

A vigorous campaign has been going on around the globe in the initiation of the developed world to win the battle against infectious and parasitic diseases. The attention of this campaign has shifted to the developing world as the disease pattern in the west inclined more towards the Man Made and Degenerative Diseases (Olshansky et al., 1997). In fact, over the past few decades, chronic diseases such as cancer, heart diseases, and stroke gradually replaced communicable diseases as the leading causes of mortality and morbidity in industrialised nations. These diseases were the top three causes of death, accountable for nearly two-thirds of all deaths in the United States in 1990, whereas in 1900, the three leading causes of death were pneumonia, tuberculosis, and diarrhoea including enteritis and all communicable diseases (Rockett, 1994).

Apart from the top three causes mentioned above, the so-called social pathologies such as homicide, cirrhosis of the liver, suicides, human immune-deficiency virus (HIV) infection and its lethal sequel, the AIDS, are among the other leading killers of Americas in the early 1990s, with HIV infection entering the ranks of the top 10 causes of death. Nevertheless, contrary to the expectations of many health experts and social scientists, tuberculosis was undergoing resurgence in the United States, as were several other communicable diseases associated with poverty and unhealthy lifestyle in the same period (Rockett, 1994). In general, however, in the early 1990s it is the "infectious and parasitic diseases" that was taking the highest percentage and number of lives in the developing countries, whereas it was the "diseases of circulatory system" that was accountable for the highest deaths in the developed countries (Table 3.1).

McKeown (1979) has noted that declines in tuberculosis, bronchitis, pneumonia, influenza, whooping cough, and measles occurred in England and Wales long before medical interventions for these diseases were widely available (Olshansky et al., 1997). On the other hand, with respect to the current situation, it has been observed that many infectious and parasitic diseases can be prevented or cured through relatively inexpensive immunisations and public health measures, such as, by the treatment of drinking water, proper food storage, personal hygiene, and through such behaviour changes as sexual abstinence and safe sexual practice (Olshansky et al., 1997).

Table 3.1

Causes of Death in the Developing and the Developed Countries, 1993.

Causes	Percentage and Number of Deaths	
	Developing	Developed
Infectious and parasitic diseases	41.5	1.2
	(16,310)	(135)
Diseases of the circulatory system	10.7	46.7
	(4,222)	(5,454)
Malignant neoplasms	8.9	21.6
	(3,490)	(2,523)
External causes	7.9	7.5
	(3,118)	(879)
Perinatal and neonatal causes	7.9	0.7
	(2,097)	(83)
Chronic lower respiratory diseases	5.0	7.8
	(1,983)	(905)
Maternal causes	1.3	-
	(508)	(-)
Other and unknown causes	16.8	14.5
	(6,602)	(1,692)

Source: Table based on Figure 5, page 20, WHO, 1995.
Notes: Figures under parentheses are the number of deaths in thousands.
"-" shows "almost none maternal causes."

Epidemiological Situation in Nepal

The epidemiological situation in Nepal was not known until fairly recently. Health facilities, health manpower, and studies on health status of Nepalese people started only in the 1950s and developed later in the 1980s. However, the epidemiological study of Nepal is of great interest to health experts and social scientists, perhaps, because of Nepal's seclusion from the rest of the world until 1951, its diversified climate and altitude, and its ethnic heterogeneity. A few individuals and teams of expeditions (Taylor, 1951; Svensson, 1956; Tokunaga, 1957; Dunn, 1962; McKinnon, 1968; Lang and Lang, 1971) had conducted studies on health problems at various locations and in some existing hospitals in the 1950s and 1960s. A few other studies (Morely, 1950; Stonor, 1955; Evans, 1956; Millar, 1957; Weatherall and Vella, 1960; Jackson et al., 1960, as cited in Dunn, 1962) have looked at the health and morbidity conditions of the Nepalese Gurkha soldiers and the Sherpas of Nepal.

These studies show that the prevalence of different diseases has depended in part on the altitude and climate of the areas examined. Some visitors to Nepal and foreign doctors initially serving in India mentioned smallpox, outbreak of cholera, goitre, leprosy, rheumatism, typhoid, tuberculosis in Kathmandu, and malaria in the Terai (the flat land in the south of the country) as early as 1850 (Hodgson, 1857 as cited in Dixit, 1995; Oldfeild, 1880; Dixit, 1995). The census report of 1957 talks about the mass killing by the influenza epidemic in 1917/18. Among other evidence, smallpox epidemic in the Kathmandu Valley in the first quarter of the twentieth century, was mentioned in a religious Newar song of "Sitala Maju" (Mother Sitala), the Goddess of smallpox.

The government of Nepal launched family planning programmes, tuberculosis and malaria eradication programmes in the 1950s, and smallpox and leprosy eradication projects in the 1960s under the First Five Year Development Plan (1956-1961). These programmes initially served the people in and around the Kathmandu Valley, with the exception of malaria programme, which was targeted to the Terai people (United Nations, 1980; Singh, 1985; Dixit, 1995). In the 1950s, the main health ailments among Nepalese people were tuberculosis, malaria, dysentery, goitre, bronchitis/asthma, typhoid, leprosy, rheumatism/arthritis, otitis (ear diseases), eye diseases, kala-azar (disease which occurs in tropical countries and shows itself in fever, anaemia, dropsy and swelling of the liver and spleen; see Medical Dictionary, 1963: 89), gonorrhoea, and diarrhoea, with a few cases of heart disease, bladder stone, cancer and injuries/fractures and rare cases of smallpox and cholera (Taylor, 1951; Svensson, 1956; Tokunaga, 1957; Dunn, 1962). Most of these diseases have remained health hazard in the 1960s (though fewer cases of typhoid, kala-azar, but more of skin diseases, epilepsy and burns) (McKinnon, 1968; Lang and Lang, 1971; Dixit, 1995).

During the 1970s and the early 1980s, the disease pattern changed from epidemic to non-epidemic infectious and parasitic diseases, diseases related to respiratory, digestive, circulatory, genito-urinary, and nervous systems, complications related to pregnancy, skin, eye, and ear diseases. By this time, accidental and injury related cases were also noticeable (Lang and Lang, 1971; Hellen, 1983; World Health Organization, 1986). By the end of the1980s, skin diseases, parasitic infections, acute respiratory infection (ARI), diarrhoea, gastritis, bronchitis/pneumonia, peptic ulcer, chest diseases, and accidents/injuries emerged as the main diseases. Skin diseases remained the leading morbidity in the mid- and late 1990s (World Health Organization, 1993; Ministry of Health, 1997a; Ministry of Health, 1997b). Typhoid, tuberculosis, and goitre cases have gone down significantly, with even fewer cases of leprosy and kala-azar, especially malaria (Ministry of Health, 1997b).

It was only during the Sixth Five Year Plan (1980-1985) that the health sector of development plan initiated the demographic aspect of health such as, delivering basic health services to the maximum number of people to increase life expectancy, controlling deaths from infectious and epidemic diseases through preventative services, improving nutritional level and environmental hygiene, and controlling the birth rate (Sigdel, 1998). The Eighth Five Year Plan (1992-1997) allotted 3.6 percent of the total development expenditure to health sector (Sigdel, 1998).

Nepal has a unique history. Although never colonised, it had to experience an unusually cruel autocratic Rana regime for 104 years until 1951, when the people were finally able to overthrow it and bring democracy to the country. Once the people of Nepal became free, having been in darkness for a century, they realised the overwhelmingly underdeveloped condition of their motherland. Peoples' priority then focused on education. Government, private, and missionary schools began to open. Since the newly acquired freedom in the early 1950s, a slow but steady development has been taking place in most parts of the country, most significantly in the capital city, Kathmandu. As a result, the country's demography has started to change. Mortality is improving steadily; proportion of people aged 60 and above is increasing, total fertility rate dropped to 5.6 in 1991 and to 4.6 in 1996, and finally to 4.1 in 2001; and massive internal migration has been experienced within the past few years (Central Bureau of Statistics, 1995; Ministry of Health, 1997; Central Bureau of Statistics, 2000).

Among the three models proposed by Omran (1971), Nepal (as most other developing nations) fits into the "Contemporary (or Delayed) Epidemiological Transition Model," with steadily declining yet high mortality, especially among infants, children and women of reproductive age, coupled with substantially high fertility. Thus, Nepal seems to be in the second stage of epidemiological transition, characterised by steadily declining mortality, increasing life expectancy and recent sustained fertility declines (Ministry of Health, 2002). Furthermore, although the deadly diseases of the pre- and post-World War II period, such as typhoid, tuberculosis, malaria, smallpox and cholera, have either disappeared or decreased significantly, skin diseases, diarrhoea and worms, and acute respiratory infection remain as the diseases of most concern in Nepal (Ministry of Health, 1997b).

As revealed by the 2001 census report of Nepal, "respiratory diseases" is the leading cause of death in Nepal for the year 2000 (Table 3.2). What stands out the most from this Table is that cancer and heart diseases have appeared among the top 12 causes of death, cancer taking fourth place and heart disease seventh place. Other noticeable causes of death are "accidents" and "suicide," with jaundice, typhoid, and malaria as other causes among the top twelve. Maternity-related cause of death is ranked third among the major causes of female deaths. It is of great concern that tuberculosis, a highly contagious disease, is still a major one that kills many Nepalese. Thus, speaking from an epidemiological perspective, Nepal seems to have entered the third stage. There are many factors affecting (directly and indirectly) Nepal's epidemiological transition as will be discussed in the following sections of this chapter.

A literature review on health situation of Nepal reveals that except for some Ayurvedic practitioners, compounders (primary health care persons), faith healers, and a few hospitals here and there, the country had none or few medical facilities until the early 1950s. Although, a significant health manpower and facilities have been developed, the current health service sector is not sufficient for a population with as high a growth rate as 2.4. By the time new health policies and programmes were being implemented, the population of Nepal grew from 11 million in 1971 to 18 million in 1991 and to 22.7 million in 2001 (Central Bureau of Statistics, 2002). The policies and programmes initially targeted for a relatively smaller size of population seemed inadequate for an uncontrollably growing population. The situation of health and development in Nepal then becomes an important topic of discussion in understanding the Nepalese healthcare system and people's perception of health and development.

Table 3.2: Top Twelve Causes of Death for Nepal by Sex and Age Groups (12 Months Preceding Census), 2001

Cause of death	Total deaths both sexes (%)	Percentage of deaths to males				Percentage of deaths to females			
		Total	0-14 yrs	15-65 yrs	65 + yrs	Total	0-14 yrs	15-65 yrs	65 + yrs
Asthma/bronchitis	6.71 (7,170)	6.93 (4,127)	1.68 (262)	6.58 (1,449)	11.02 (2,416)	6.44 (3,043)	0.79 (102)	7.68 (1,298)	9.38 (1,643)
Cholera/diarrhoea	4.79 (5,119)	4.53 (2,698)	11.87 (1,852)	2.32 (510)	1.53 (335)	5.12 (2,421)	12.18 (1,565)	3.22 (544)	1.77 (311)
Maternity-related*	2.22 (2,377)	0	0	0	0	5.03 (2,377)	8.62 (1,108)	6.10 (1,031)	1.36 (238)
Pneumonia	4.15 (4,429)	4.19 (2,494)	13.43 (2,095)	0.93 (204)	0.88 (194)	4.09 (1,935)	12.22 (1,570)	1.03 (175)	1.08 (190)
Cancer	3.63 (3,879)	3.59 (2,139)	1.57 (165)	5.87 (1,293)	3.11 (681)	3.68 (1,740)	1.06 (136)	6.56 (1,108)	2.83 (496)
Tuberculosis	3.18 (3,397)	3.85 (2,294)	1.56 (243)	6.47 (1,424)	2.86 (627)	2.33 (1,103)	0.72 (92)	4.75 (802)	1.19 (209)
Accident (unrelated to vehicle/transport)	2.72 (2,906)	3.32 (1,978)	2.80 (437)	5.87 (1,293)	1.13 (248)	1.96 (928)	2.23 (287)	2.76 (467)	1.00 (175)
Heart diseases	2.67 (2,854)	2.90 (1,726)	0.93 (146)	4.35 (958)	2.84 (622)	2.39 (1,128)	1.06 (136)	3.65 (617)	2.14 (374)
Suicide	1.40 (1,492)	1.50 (894)	1.22 (190)	2.89 (637)	0.31 (68)	1.26 (598)	0.53 (68)	2.91 (491)	0.22 (39)
Accident (transport-related)	1.37 (1,468)	1.95 (1,162)	0.97 (151)	4.06 (894)	0.53 (117)	0.65 (306)	0.65 (83)	0.36 (146)	0.44 (78)
Jaundice	1.08 (1,152)	1.16 (690)	1.24 (194)	1.81 (399)	0.44 (97)	0.98 (462)	1.21 (156)	1.55 (262)	0.25 (44)
Typhoid	1.07 (1,143)	0.96 (574)	1.52 (238)	0.93 (204)	0.60 (131)	1.20 (569)	1.93 (248)	0.97 (165)	0.89 (156)
Malaria	1.06 (1,128)	0.89 (530)	1.43 (224)	0.82 (180)	0.57 (126)	1.26 (598)	2.19 (282)	1.18 (199)	0.67 (117)
All other causes	63.93 (68,275)	64.22 (38,238)	60.29 (9,407)	57.10 (12,571)	74.17 (16,262)	63.58 (30,037)	54.60 (7,015)	56.76 (9,587)	76.75 (13,435)
All causes	100 (106,789)	100 (59,544)	100 (15,604)	100 (22,016)	100 (21,924)	100 (47,245)	100 (12,848)	100 (16,892)	100 (17,505)

Source: Table 6, Central Bureau of Statistics, 2002. http://www.cbs.gov.np. Figures in parentheses are the no. of deaths; * only for females

Health and Development in Nepal

Development in health and education was introduced in Nepal after the country's freedom from the Rana regime in 1951. Until then, development whether in the field of health or any other sector was an uncommon term for the Nepalese. Thus, Nepalese may have different perceptions about health and development. Development needs to be viewed in a different way in a country such as Nepal, where natural resources are limited and only 12 percent of the land is arable for the 90 percent population that depends on agriculture. In addition, lack of communication between the villages and the central government has been a tremendous hindrance to the development of the country, most parts of which are rural.

People finally saw a ray of hope in the field of development and health when the First Five Year Development Plan (1956-1961) was introduced in Nepal in 1954, during which period the Ministry of Health was established, primarily to eradicate smallpox and to control malaria (Sigdel, 1998). During the same period, the existing hospitals were upgraded and a maternity hospital, the first specialised hospital in Nepal, was also established. Although modernisation began in the early 1970s (Taylor and Taylor, 1976) the damage done by 104 years of Rana's rule was so intense that the severely handicapped rural areas suffer even today. Taylor and Taylor (1976) gave their opinion that the greatest obstacle to economic development in Nepal was that the villagers had little expectation in improvement and were only beginning to understand the possibility of change. Although the development planning was targeted to rural areas under rural development sector, most of the plan has been inclined to urban areas.

Nepalese people also blame their own self-contented nature for the slow development of the country. Their nature is, perhaps, grounded on the circumstances in which they have been living (Bista, 1991). Bista (1991) analysed that Nepalese may be poor by international standards but the Nepalese peasants have historically been self-sufficient and largely content, and the idea of foreign assistance is a new one. Even among urban dwellers, because of their isolation from international affairs, Nepalese had no idea until a few decades ago that they were relatively impoverished. Once called "content and non-competitive," the Nepalese began to express dissatisfaction with their current socio-economic situation (Bista, 1991). In recent decades, although various development projects, health-related as well as others, both national and international, are growing in number, a systematic monitoring of the progress of development in terms of how such projects affect the concerned people or how beneficial are the project outcome is lacking in the country (Bista, 1991). Many such projects and efforts are, thus, wasted at one time or the other, resulting in villagers' loss of interest and respect for development projects. One such example is that of the "breastfeeding project" that was started in a few rural areas in the 1980s, where virtually everybody breastfed (Stone, 1986). The villagers began to criticise this project, which later on proved to be the most unsuccessful rural development programme.

In terms of health care practice, for centuries, Nepalese people have been dependent on home remedy, herbal remedy, and traditional faith healers and birth attendants. For many ailments, people from rural areas also waited at home to get well (Justice, 1986). The introduction of modern medication and health providers sometimes brought new hopes for the villagers on the one hand and sometimes confusion and disappointment, on the other. The local elite are the ones who benefited the most from various development programmes rather than the poor target groups (Justice, 1986).

The major problems identified in the rural health care centres in Nepal such as under-staffing, under-supply, and under-utilisation in the 1980s (Justice, 1986; Stone, 1986) were still existing in the 1990s (Sigdel, 1998). Contrary to people's expectation of the new democratic government's ability to organise and develop the healthcare system and policy, the instability of the ruling governments since the early 1990s proved to be a disaster to the health care system of the country. The situation of the country has become worse yet since around 1997 onward because of the Maoist insurgence spreading all over the country. On the one hand, the scarce resources that the government could have spent on health care of the rural population have been wasted on political expenditure or exploited under the growing corruption. On the other hand, as in other developing countries, due to lack of practical knowledge, the planners and theorists widely neglected the development potential of rural areas and also the role the poor rural population could play in national development (Bongartz, 1993). The health plans, development projects, villagers' expectation, and the existing socio-cultural norms of the rural people do not seem to go hand in hand in Nepal. The socio-cultural and anthropological information is either not collected or not analysed by the planners and administrators. As Justice saw in the 1980s, the planners did not seem to know what to do with such data even when available and only the statistical data were given importance. Moreover, gathering anthropological data was thought to be time-consuming as they had to meet the deadlines given by the donor agencies.

A strong correlation between a population's health and socio-economic development has been recognised across less fortunate countries for many years (WHO, 1995). As well, there is a growing concern among these nations that the available limited health resources have largely been spent in urban areas, especially on hospital expenses. In the case of Nepal, even the relatively low share of health expenditure seems to have been wasted in the rural areas because of under-utilisation and mismanagement (Sigdel, 1998). The reasons for not using health facilities by the rural people, even in places where they are available, are plenty. One of the major reasons is lack of communication. Although some districts are accessible by air, acceptable roads are lacking in the hills and mountains. As observed in rural areas, district hospitals are far from most of the villages, sometimes as far as four days walk. The rainy season makes the roads hopelessly muddy and slippery. It is almost impossible for ailing patients including pregnant women and new mothers to go to hospitals, sometimes even to the nearest health-posts. But the health officials make field visits only during the dry months and thus, are unaware of the difficult conditions experienced by the village health workers and the patients during the monsoon season (Justice, 1986). In addition, because of the administrative inefficiency, drugs and medical equipment either do not reach the villages in time or reach in inadequate amount (Justice, 1986).

There are additional problems faced by the rural population in Nepal. Although health infrastructure has relatively improved in the last two decades, people in rural areas are still reluctant to use medical centres for several other reasons. Most surveys and researchers found that not only essential drugs and medical equipment but also trained health workers are lacking in health centres. Moreover, the available trained health workers designated to the area are often reported to be absent (Justice, 1986; Sigdel, 1998). Furthermore, the hierarchical caste differential and the conflict between the rural and urban status (rural people finding themselves intimidated by the sophisticated and educated urban health care providers) and villagers' unwillingness to deal with young staff, are only a few reasons why rural people avoid medical centres (Justice, 1986; Sigdel, 1998). In addition, the fixed hours of operation of these centres is another obstacle that prevents rural people from utilising the centres more often (Sigdel, 1998). People feel more convenient in seeking care from local traditional healers and Ayurvedic practitioners (Justice, 1986; Niraula, 1994). On the other hand, lack of medicine, medical equipment, comfortable accommodation, good food and good schools for children are only a few reasons why the designated health personnel including medical doctors are reluctant to serve remote villages.

Furthermore, health programmes fail in Nepal because of the conflict between the rural people's socio-cultural belief system and the planners' so-called modern development strategy. One such example is that of the Assistant Nurse Midwife (ANM). The training programme of ANM was based on the observation of many countries that women could be more effective than men in providing maternal and child health care, and family planning. This programme was also viewed as a means of enhancing women's social status by increasing their educational level and providing employment opportunities (Justice, 1986). As in many other developing countries, the ANM programme was not successful in Nepal as international agencies and planners had expected because traditional expectations of women conflicted with her health role (Justice, 1986). Girls' travelling and living alone is not socially acceptable in Nepal

(Ogilvie, 1993). Even if many of these girls come from ethnic groups that have freedom in societies, it is very difficult for them to travel to other parts of the country and be among other ethnic groups that are more conservative and view women from a restrictive perspective. Reports from Muslim dominated areas of the Terai revealed that the young ANMs faced social difficulties such as non-acceptance by the villagers, senior health assistants trying to take advantage of them by expecting them to serve both as assistants in the health posts and as personal maids (Justice, 1986). These girls also expressed their fearfulness of sexual advances. On the other hand, even the local young girls were not accepted as ANMs because unmarried women without children were viewed as too young and inexperienced to inspire confidence as midwives (Justice, 1986).

Apart from ANM, the government of Nepal took several other measures in the late 1970s and the early 1980s to decentralise health services to the village communities. The government being impressed by the achievement of the barefoot doctors in China, encouraged community participation to provide health care to the majority of the population (Sigdel, 1998). One such programme was that of providing trained Community Health Worker (CHW) known as Community Health Leaders in the beginning. Although 63 percent of these leaders were found to be active and popular in the communities, they failed to fulfil the demand of people for curative services. Moreover, 90 percent of them were males and thus, were not successful in reaching the village women, especially for maternal services (Sigdel, 1998). This promted the government to initiate another programme called Female Community Health Volunteers in 1988. The target was to provide 40,000 such volunteers with twelve-day training in primary health by the end of the year 2000. Such volunteers who had been active in their communities come from different backgrounds such as literate and illiterate, young and middle-aged, and high and low castes. Drawbacks were found in this programme also. Although the most important tasks that were assigned to these female volunteers were immunisation, curative care, hygiene and sanitation, and nutrition, Sigdel (1998) found that they were mostly involved in the curative services alone because of the complex nature of preventive tasks.

The other side of the story told by villagers describes a different situation in which they have to live. They seem to be well aware of the importance of some of the preventive measures and their own health problems. But because of their economic condition, villagers seem to give priority to health care for their agricultural animals rather than their own health problems or their children's (Justice, 1986). The reason behind such an attitude is that parents can replace children if something happens to them but they cannot afford to buy animals. As observed in the villages of Nepal, the planting season is so important to rural people that they would leave even the dead body of a loved one at home to go to the field for planting. If they do not plant in time during monsoon, they would starve for the rest of the year whereas cremating of a dead body and mourning for the loved one could be withheld for a day. The planners of the country, mostly city elite, and the foreign donor agencies may not have encountered or understood such conditions prevailing in the country. Moreover, the health policy guidelines are developed in Geneva or Washington, under a totally different setting (Justice, 1986).

There are other stories of non-success of the development programmes in Nepal. One such programme was the famous National Development Service (NDS), which was initiated as a credit programme for all Masters Degree students. This programme was focussed not only on all areas of rural development but also making the students aware of the country's general condition. Students were trained in various areas during the two months orientation camp, and then sent to remote areas all over the country for ten months in groups of three (women) and two (men). Started in 1974 by the Tribhuvan University, this programme was very much liked and praised by the villagers. Unfortunately, the programme was suddenly suspended in 1979 during the nation-wide student's movement. The NDS programme has, thus, been limited to sending students to villages for a few days for collecting and reporting the village profile. Even though the main reason behind the suspension of this programme was given as lack of funding, it was believed that the then monopoly Panchayat government's fear of students' persuasion of villagers to multi-party system also played a major role. As in other cases of unsuccessful development programmes, the sufferers are the underprivileged rural poor people.

Among other things, the country is also facing problems of achieving the targeted health care facilities and proper functioning of the same (Sigdel, 1998). Furthermore, the planners of the country may also have faced a dilemma of choosing ‘curative’ versus ‘preventive’ services in providing health care programmes in rural areas. Villagers expect curative service more than preventive one (Justice, 1986; Stone, 1986). In this matter also, the public sector performance is not successful because of the structural and systemic factors (Sigdel, 1998). It is only natural for the villagers, or anybody for that matter, to be inclined towards curative services that provide immediate health outcomes, rather than toward preventive services that are designed for a long-term effect. For the latter to be successful, rural people need to be convinced about its advantages first. Most importantly, adequate infrastructure should be available for the rural population for continued preventive measures. For example, availability of clean water, nutritious food, oral re-hydration ingredients, distribution of soap and proper utensils with covers, and ventilation in houses should be assured. In addition, responsible supervisors need to follow up the target households. Otherwise, developing only awareness of preventive measures is not going to affect the actual health outcome.

The development experts around the world also seem to accept the above view. In the international context, the concept of development has been broadened since the 1960s from merely an economic viewpoint to one stressing the social aspects and environmental health hazards. Safe drinking water and sanitation, pollution, deforestation, poor housing and shelter, unsafe food and high prevalence of disease vectors have been identified as the risk factors for poor health in the least developed countries (United Nations, 1998). Recently, the issues of health and development are undergoing renewed scrutiny because of a recent host of global health threats including malaria, emerging and re-emerging of diseases such as HIV/AIDS, tuberculosis, Ebola fever, chronic diseases, mounting medical expenses, and environmental degradation (United Nations, 1998). Thus, the issue of health has become a major focus in the development paradigm around the world.

In the past, a nation's gross national product (GNP) level was considered to be the main determinant of health achievement of that nation. This notion was changed during the 1970s. Preston (1976) found that for both the developed and the developing countries, factors exogenous to a nation's per capita income have had a major effect on mortality trends. Later, Preston's cross-national statistical analyses showed that two thirds of improvements in survivorship between 1930 and 1960 were attributed to public health programmes and promotion of personal health, and only one third were considered as due to the increased socio-economic levels such as income, literacy, and nutrition (Preston, 1980). Also, the average per capita income is found to be less important than the number of people living in absolute poverty and the distribution of income (relative poverty) in influencing the life expectancy (United Nations, 1998). Some of the developing countries with low income, such as China, Costa Rica, Cuba, Jamaica, Sri Lanka, and the State of Kerala in India achieving low mortality, and life expectancies almost to the level of developed countries show that health depends on more than income only (Newland, 1981; Caldwell, 1986; United Nations, 1998). Such health conditions were gained through the political commitment of the governments in those countries for wider access to health services, education, and food subsidy programmes (Caldwell, 1986; United Nations, 1998). In the case of Nepal, to achieve such health conditions all over the country, making structural changes at the centre and providing strong political and administrative support rather than at the local periphery should be number one priority (Justice, 1986). Nepal's experience shows that structural change and socio-cultural background along with socio-economic development also play a significant role in the health development of a country.

Along with health care facilities and socio-economic improvement, a change in socio-cultural attitude seems like an essential factor in the development of health of a nation. In Nepal, the situation of adverse social realities and racial discrimination may have changed somewhat in the nineties but not entirely. How women are treated and how women's freedom is perceived in a society, become very important aspects in the development of health area in a country such as Nepal. Respecting women as mothers, sisters, daughters, wives, and co-workers; enhancing women's status and autonomy; giving women equal opportunity in different areas of development; and appreciating women's contribution in the family and society may have significant impact in achieving the desired health outcome.

Apart from gender discrimination, racial discrimination is a big hindrance to health development in Nepal. Although, the law of Nepal does not allow for any kind of discrimination, the majority of the so-called high caste people have not been able to abandon such attitudes. The announcement of the then Prime Minister Sher Bahadur Deuba in September 2001 that all the so-called untouchables be allowed to enter Hindu temples for worship, otherwise strict action will be taken against the priests or other responsible persons, is a benchmark for the country. On the other hand, besides the caste hierarchy, there exists status and class differential among the rich and the poor especially in the Terai areas where the *Jamindari* system (land owner and tenant system) still prevail. Although, slavery was abolished in Nepal in 1928, the tenants still consider the landowners as Lords and address them *malik* (the Lord). The landlords may not necessarily treat them as slaves, but these tenants have to rely on landlords whenever they need to borrow money. The interest rates were so high that the tenants, called *Kamaiya*, were never able to pay the loan back and, thus, they work free of labour charge for their masters. And such free work has been continuing for generations. Development of any kind in such situations may remain just a formal 'word' in Nepal's long-term plans. Development would be possible only with collective effort of men and women, irrespective of their caste or status hierarchy, without which Nepal may not succeed in achieving its goal of completing the epidemiological transition.

There are about 100,000 persons including young girls and boys working under such bonded labour system locally known as *Kamaiya system* in the Terai area (Human Rights Report, Nepal, 1999). For over a century, the government of Nepal has overlooked this problem of so-called "low caste" people of the Terai. These poor people, most of who belong to the western Terai, never dreamt of coming out of this web. The young girls and boys of school going age are deprived of formal education in many cases because of this *Kamaiya* system. This problem was taken seriously by the government only in the year 2000. As a result, releasing people from such bondage and distributing land to them is now underway (The Kathmandu Post, 2001). Bold steps such as these, need to be taken by the government of Nepal to enhance the overall development, including the development in the area of health.

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Chapter IV

Socio-Cultural Dynamics of Birth Intervals in Nepal[a]

Introduction

Event histories such as birth, pregnancy, and marriage have been used by social scientists to study fertility behaviour of women. Birth history analysis undoubtedly provides useful information regarding reproduction and family formation. Fertility depends not only on the decisions of couples but also on many socio-economic, demographic, healthcare-related as well as tradition-related and emotional factors. The factors affecting fertility may have varying effects on child spacing. Thus, birth intervals experienced by women may reveal some insights about their reproduction patterns. Moreover, a detailed analysis of the sequence of steps in the childbearing process could provide a more comprehensive picture of the dynamics of fertility transitions (Hirschman and Rindfuss, 1980). The purpose of this chapter is to analyse three consecutive birth intervals to gain a better understanding of the fertility behaviour of Nepalese women.

Bongaarts (1978) found that the level of fertility in a group of women depends mainly on four intermediate variables: the proportion that is married, postpartum infecundability, contraception, and induced abortion. In other words, differences in exposure to the risk of pregnancy and differences in the length of time between births when women are exposed may contribute to differentials in childbearing levels (Trussell et al., 1985). Whatever the cause, the length of birth intervals may vary from one population of women to another.

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[a] A version of this chapter has been published. Suwal 2001. Contributions to Nepalese Studies, 28(1):11-33.

Social scientists believe that differences in birth-interval lengths are explained by varying breastfeeding patterns, contraceptive use, frequency of intercourse, incidence of abortion, and fecundity (Trussell et al., 1985). Differences in other factors such as women's roles and status and the value of children may also influence the birth intervals. There is no doubt that the socio-economic, demographic, health and cultural background of a country, consequently that of women, affects the above factors. In addition, factors affecting family size were found to vary by birth parity (West, 1987).

This chapter intends to explore several questions regarding the socio-economic, demographic, and cultural differentials on birth intervals. Do the levels of education and different occupations of women or their spouses affect the timing of births? Does age has to do anything with the birth intervals? Do the cultural and religious differences of women affect the interval between births? Or is it the sex of the first/second child/children that determines the waiting period between the later births? What factors influence birth intervals the most for the women in the past and the young women today? And, most importantly, the intention is to find out how such factors and differentials influence the demographic and epidemiological transitions in Nepal.

Factors Affecting Birth Intervals

Women's education and age at marriage are the two most widely analysed determinants of birth intervals. The former is found to have a substantial effect on birth-interval length (Hirschman and Rindfuss, 1980; Rindfuss et al., 1983). However, in a study done in a village of Kerala State in India, Nair (1996) did not find any significant effects in terms of the education of women either on the first or the second or the third birth intervals. In addition, female education was found to be an insignificant determinant of the risk of pregnancy in Malaysia, the Philippines, and Indonesia (Trussell et al., 1985). Nevertheless, male education and occupation were found to be significant determinants of fertility in Indonesia and the Philippines.

Age at marriage is considered to be an important variable in the fertility process. If couples marry at a very young age, their decisions about the number of children desired, about the use of contraceptives, and similar issues may be immature, consequently affecting the birth interval (Bumpass et al., 1978). Furthermore, because the effect of age at marriage possibly operates through biological and maturational factors rather than with respect to coital frequency (Kallan and Udry, 1986), age at marriage may have a varied effect on different birth intervals. Age at marriage correlates to age at first birth. For young women, West (1987) found that the first birth is an important determinant at the transition from parity one to parity two. For older women, he found its importance at the transition from parity two to parity three. Interestingly, his findings also showed that the younger a woman is at first birth, the higher the transition probability. In another study, Abdel-Aziz (1983) concluded that the later a Jordanian girl marries, the swifter she will bear her first child. A similar result was found in Nepal. The women of Tamang ethnicity, who married at age 19 or older, had higher chances of childbirth than those marrying at younger age (Fricke and Teachman, 1993).

A couple's decision on the timing of the first baby or the second or the third may depend on traditional norms and cultural practices as well. Ethnicity was found to be an important determinant of pregnancy in Malaysia (Rindfuss et al., 1983). Nair's (1996) analysis of birth intervals suggested that a significant differential existed between Hindus and Muslims in Kerala for the first and the second birth intervals, but not for the third. Confucian women were found to have their first birth at least 2.5 to 3 years later than Muslim and Hindu women (Rindfuss et al., 1983). This suggests that religion is an important factor in the fertility behaviour of women in Asia.

Place of residence may be another important factor influencing birth intervals. According to the place of residence, people's customs and lifestyles may differ. Rural women may breastfeed for a longer duration than urban women, urban women may use contraceptives more often than rural women, and the socio-economic status of urban women may be higher than that of rural women, resulting in better health and knowledge of and easier access to contraception for the former.

There have been a few empirical studies done in Nepal on birth intervals. However, the diversified cultural and religious practices, preference for sons, varied lifestyles in different regions of the country, different types of marriages (such as arranged, cross-cousin, capture, elopement, polygamous, fraternal polyandry, and self-spouse selection) in different ethnic groups, illegality of abortion, and social environments make research on this area not only interesting but also rewarding to gain insight into the fertility behaviour of Nepalese women.

Data and Methods

The data source for this study is the Nepal Fertility, Family Planning and Health Survey, 1991, which was conducted under the Demographic Health Survey (DHS), Macro International Inc., Maryland, U.S.A. The sample size was 25,384, of which 5.3 percent were urban and 94.7 percent were rural women. The sample unit is women in the age group 15-49 who were living with their husbands at the time of the survey. The sample frame is the voter's list of 1990 prepared by the National Election Commission, Nepal (Nepal Fertility, Family Planning and Health Survey, 1993).

In general, two wards were selected from each 'Village Development Committee (VDC).' Urban wards were selected directly as the primary sampling units. To minimize the constraints of a huge sample size, vast geographical spread, and different languages, the field work was done in two phases with 26 supervisors and 78 interviewers for the first phase and with 49 field supervisors and 147 interviewers for the second phase. Interviewers were selected according to their ability to speak the local language, their academic qualifications, and previous work experience. The training for supervisors and interviewers was a three-week intensive programme. For both phases of the survey, all interviewers were female and most of the field supervisors were male. The survey was completed by 75 field teams, each consisting of one supervisor and three female interviewers within a period of seven months, August to October, 1991 for the first phase and November, 1991 to February, 1992 for the second phase.

Several measures such as the design of a clear and precise questionnaire, pre-testing of it in several locations, recruitment of interviewers from different locations, formation of appropriate field teams, preparation of survey manuals, spot-check forms, interview schedules, questionnaire checking, and supervision of field work, ensured high degree of quality control of the survey. A pre-test was also done in June 1991 by trained field supervisors and interviewers in non-sample areas of two hill and three Terai districts covering 500 households (Nepal Fertility, Family Planning and Health Survey, 1993).

Time-constant Cox regression is used for the statistical analysis of the data. The model, also known as the Cox proportional hazards model, is given by:

$$h(t) = [h_0(t)]e^{B_1X_1+B_2X_2+\dots\dots\dots+B_nX_n}$$

where, $X_1, X_2, \dots\dots\dots, X_n$ are the covariates (i.e. independent variables)

$B_1, B_2, \dots\dots\dots, B_n$ are the respective coefficients of each covariate that are also known as relative risks in the Cox regression.

$h_0(t)$ is the common baseline (reference group) hazard or duration-dependent risk. The duration dependent risk in this case is the "chance of being pregnant."

$h(t)$, the hazard function (birth interval or duration variable in this case), is the dependent variable. This is the product of the duration-dependent risk $h_0(t)$ and the effect of $X_1, X_2, \dots\dots, X_n$ for any given set of values of these variables.

The hazard function enables one to estimate the relative risks of other groups in relation to the baseline group (Balkrishnan et al., 1987). Cox regression is useful for analysing events with duration-specific risks. Furthermore, the Cox regression model can be used to analyse data with censored observations (Norusis, 1994). Multiple linear regressions cannot be used for analysis of time-to-event data because it cannot handle censored observations. Censoring is caused by the incomplete experience of the events studied (Halli and Rao, 1992). Only event history analysis can make use of the information on censored (incomplete) observations.

For the current study, the "events" are the first union with a husband, the first birth, the second birth and the third birth. Censoring in this case is "no birth" or non-occurrence of birth in a particular birth interval. Thus, the cases in which women do not have any children until the day of the survey are "censored" cases for the first birth interval. Those women who already have one child but have not given birth to a second child until the day of the survey are "censored" for the second birth interval. Similarly, women with only two children on the survey day are "censored" cases for the third birth interval.

The dependent variables are the first birth interval (the time between marriage and the first birth), the second birth interval (duration between the first and the second births), and the third birth interval (period between the second and the third births)[1]. Each dependent variable is analysed separately by Cox regression. The independent variables selected are respondent's place of residence, religion, ethnicity, current age, age at first union (with the husband)[2], cash earning, education, occupation, education of husband, occupation of husband, and sex of previous child/children. The reasons for selecting these particular variables are: (a) as discussed earlier, these variables are good predictors of fertility behaviours, (b) all of these variables are included in the thesis model (Figure 1.1), and (c) the response rate for the questions related to these variables in the survey were high unlike in cases such as "breastfeeding" variable where missing cases were very high and thus, could not be included in the analysis. A positive value of B indicates a higher hazard (chance) of pregnancy and, consequently, a shorter birth interval that may result in higher fertility.

Measurement

Among the independent variables, "age of respondent" and "age at first union" are measured by the actual age in years. Residence is recoded as urban 1 and rural 0, cash earning as earning 1 and not earning 0, sex as male 1 and female 0 for both the second and the third births. In all the cases, '0' denotes the reference category. Ethnicity, religion, education, and occupation are categorical variables, recoded as shown in Table 4.1.

Limitations

In spite of useful information regarding fertility behaviour and family formation, birth history analysis has several limitations. Recall lapse by the older women is one of the most reported errors (Bogue and Bogue, 1970; Brass, 1980; Singh et al., 1988). In other studies, misreporting of age, and omission of the first births were found (Kallan and Udry, 1986; Islam, 1988). Age heaping, recall lapse, and mis-reporting of the date of events are some of the common errors found in the surveys done in Nepal (Ministry of Health, 1993; Central Bureau of Statistics, 1995; Ministry of Health, 1997). World Fertility Surveys in several countries have found that the earliest births reported by older women tend to be "moved forward" toward the present. This resulted in longer first birth intervals for older women than for younger ones (Kallan and Udry, 1986). Such mis-reporting may be common in Nepal because rural populations may consider early or immediate conception following marriage as shameful[3]. Moreover, women who had given birth in previous marriages may not want to report those births. Other birth omissions may be those of dead children.

Table 4.1

Measurement of Categorical Variables

Variable	Categories	Category value	Coding for analysis[a]
Ethnicity[b]	Brahmin+ Chhetri	1	0
	Newar	2	1
	Mongoloid groups	3	1
	Other	4	1
Religion	Hindu	1	0
	Buddhist	2	1
	Muslim	3	1
	Other	4	1
Education level	Never attended school to primary level	1	0
	Middle school level	2	1
	School Leaving Certificate[c]	3	1
	Post secondary level	4	1
Occupation	Agriculture	1	0
	Business + Cottage industry	2	1
	Service (administrators, technicians, professionals)	3	1
	Daily wages	4	1
	Other (students, unemployed, etc.)	5	1

Note: a. Value "0" represents reference group.

b. "Brahmins and Chhetris" are the so-called high caste groups in the Hindu hierarchy. The Newars are the aboriginals of the Kathmandu Valley. "Mongoloid group" consists of the Gurungs, the Magars, the Rais, the Tamangs, he Limbus and the Sherpas, originally the hills and mountain dwellers.

c. At the time of data analysis, Primary level represent Grade 1-5, Middle school Grade 6-9, and SLC is the School Leaving Certificate level, equivalent to grade 10. Most of the high schools have grade 10 levels in Nepal. High schools that have grade 12 are called "10+2 programme" schools.

In the analysis section, although breastfeeding, contraceptive use, and induced abortion are considered to be important intermediate factors that influence birth intervals and through which socio-economic and demographic factors affect births, they had to be excluded for several reasons. The analysis of breastfeeding variable was not possible because of a large proportion of missing cases (about 90 %) in the data set. Since breastfeeding is universal in Nepal, it probably would have similar impact on all birth intervals across different cultural groups and regional populations. However, because Nepalese women tend to breastfeed the first born for a longer period than the subsequent children, the study of duration of breastfeeding on different birth intervals would have been useful and interesting, had the data allowed.

Conscious birth spacing is not a popular practice in Nepal. Most couples use sterilisation once they have the desired number of children. Among the 24.1 percent women who were using any modern family planning method in 1991 Nepal Fertility, Family Planning, and Health Survey, only 4.5 percent were using contraceptives for birth spacing, the rest 19.6 percent had been sterilised (either wives sterilised or the husbands). Couples using contraceptives for spacing between births (so-called spacers) increased slowly from 0.9 percent in 1976 to 2.1 percent in 1986 to 4.5 percent in 1991. There were very few cases of spacers in the old cohorts of women in the survey; these few cases were dropped from the analysis[4].

Also, because of the lack of official data on induced abortion, it is not possible to study the effect of this factor on birth intervals. Finally, the interpretation of the findings for the "ethnicity" variable should be done with caution because ethnicity had to be divided into four categories by combining a number of groups, and thus the different cultural and social practices within these categories are impossible to detect[5]. For instance, though categorised as "Mongoloid", the Sherpas practice polyandry while the Gurungs prefer cross-cousin marriage, and the category "other ethnicity" includes more than 40 ethnic groups. One additional limitation is that as the average birth intervals (See Table 4.2) are computed from complete as well as incomplete (censored as well as truncated)[6] intervals, this may bias the results to some extent.

Results

When we look at the average birth intervals, the first interval is the longest of the three (Table 4.2). That is, couples waited for almost four years on average before they had their first baby. The average duration of the second and third birth intervals do not differ much. Couples seem to wait almost three years, on average, for their second and the third child.

There may be several reasons why couples have longer first birth interval than the other two intervals. First, because of the usual young age at marriage of Nepalese women, they may not yet be biologically ready to become pregnant[7]. Second, since most of the marriages are arranged, couples may need time to establish an intimate relationship. Third, women in some cultures may spend more time in their natal home than their husband's home before they have their first child. And finally, Nepalese women are by nature shy and modest about sex.

Table 4.2

Average Birth Intervals in Nepal, 1991

Birth Intervals	Average Period (in years)
First (marriage to first birth)	3.9
Second (first birth to second birth)	2.8
Third (second birth to third birth)	2.9

Source: Computed from the Nepal Fertility, Family Planning and Health Survey, 1991 data.

Table 4.3 presents the Cox regression results for each of the three birth intervals when the variables were entered one at a time. Each result shows the individual effect of a particular variable on different birth intervals. Table 4.4, on the other hand, gives the result of Cox regression for each independent variable when the effects of the remaining variables are controlled. The summary of the results from Table 4.3 is presented below in a tabular form. The positive or the negative sign of the hazard coefficient B depicts the shorter or longer birth interval in the three equations.

Table 4.3

Cox Regression Results for Parity Probabilities when Socio-economic and Demographic Variables are Considered One at a Time, Nepal, 1991.

Variable	B (for first birth interval)	B (for second birth interval)	B (for third birth interval)
Residence (urban)	.2669*	.1201*	-.1820*
Age of respondent	-.0257*	-.0021*	.0047*
Age at first union	.0852*	-.0089*	-.0154*
Ethnicity (Ref. Brahmin + Chhetri)			
Newar	.3614*	.0342	-.1938*
Mongoloid	.1791*	-.0262	-.0021
Other	.0052	.0052	.0367
Religion (Ref. Hindu)			
Buddhist	.1296*	-.0992*	-.0416
Muslim	-.2021*	.0293	.1625*
Other	.1871*	-.0046	-.0091
Education of women (Ref. 0 - grade 5)			
Middle school (grade 6 - 9)	.2133*	.0880	-.0998
School Leaving Certificate (SLC or Gr. 10)	.3150*	.0343	-.4032*
Post secondary	.3004*	-.1526	-1.2857*
Education of husband (Ref. 0 - grade 5)			
Middle school (grade 6 - 9)	.0398	.0107	-.0733*
School Leaving Certificate (SLC or Gr. 10)	.1418*	-.0082	-.1387*
Post secondary	.1649*	-.0092	-.2904*
Occupation of women (Ref. agriculture)			
Business + cottage industry	.2034*	.1282*	-.0708
Service	.4383*	-.0979	-.5657*
Daily wages	-.0835*	.0052	.0105
Other	.0838*	.0233	-.0489*
Occupation of husband (Ref. agriculture)			
Business + cottage industry	.1357*	.0920*	-.0818*
Service	.0978*	-.0817*	-.2428*
Daily wages	-.0227	-.0171	-.0076
Other	-.0276	-.1779*	-.0580
Cash earning by women (yes)	-.0136	.0116	-.0315
Sex of first child (male)	-	-.0552*	-.1016*
Sex of second child (male)	-	-	-.1149*

* significant at $P \leq .05$.

Results of Table 4.3 in a Tabular Form

Variable condition	1st birth interval	2nd birth interval	3rd birth interval
Compared to rural,			
Urban women have	Shorter	Shorter	Longer
Higher the age of women	Longer	Longer	Shorter
Higher the age at first Union with husband	Shorter	Longer	Longer
Compared to Brahmins and Chhetris, (see Table 1 for def.)			
Newar women have	Shorter	-	Longer
Mongoloid women have	Shorter	-	-
Compared to Hindus,			
Buddhist women have	Shorter	Longer	-
Muslim women have	Longer	-	Shorter
Women in 'other' have	Shorter	-	-
Compared to women with Elementary or no education,			
Women with middle sch have	Shorter	-	-
Women with gr. 10 edu. Have	Shorter	-	Longer
Women with post-sec edu.	Shorter	-	Longer
Compared to women whose Husbands have ele. or no sch,			
Husband's middle sch have	-	-	Longer
Husband's grade 10 edu. have	Shorter	-	Longer
Husband's post second. Have	Shorter	-	Longer
Compared to women in agri.,			
Women in busi & cott. ind.	Shorter	Shorter	-
Women in service have (see Table 1 for definition)	Shorter	-	Longer
Women in daily wages have	Longer	-	-
Women in 'other' occu. Have	Shorter	-	Longer
Compared to women whose Husbands are in agriculture,			
Husbands in bus. & cottage Industry have	Shorter	Shorter	Longer
Husbands in service have	Shorter	Longer	Longer
Husbands in 'other' have	-	Longer	-
If sex of 1st child is male,	-	Longer	Longer
If sex of 2nd child is male	-	-	Longer

Note: "-" represents "insignificant" results.

When all the variables were entered together (Table 4.4), the Cox regression results show a different picture. Most of the effects that were significant in the earlier equations disappeared once the effect of each variable was isolated, controlling for effects of the remaining variables. This Table (4.4) shows that even when all the other effects are controlled, place of residence, age of respondent, age at first union, ethnicity, and education of women still have significant influences on the first birth interval. Positive coefficient B= 0.272 tells us that urban women have higher risk of getting pregnant than rural for the first birth even with all things equal. In other words, urban women still have shorter first birth intervals than rural ones. As the age of the responding women increases, their first child is born later still holds true (B= -.022). The higher the age of women at first union with their husbands, the quicker they conceive the first child (B= 0.099). Mongoloid women have shorter first birth intervals than their Brahmin and Chettri peers (B= 0.313), and those women who have middle school education have a higher chance of being pregnant than those with elementary or no education (B= 0.144).

After the effects of all other factors are controlled, the influence of occupation of women (in "business or a cottage industry" versus "agriculture" category) on the timing of the first-born changes its direction. That is, women who are involved in a business or cottage industry wait longer to have their first child compared to those women whose occupation is agriculture (B= -0.262). This result suggests that there were effects from other variables, which led women involved in business and cottage industry to have their first child sooner than their peers in agricultural occupations (Table 4.3). So, once all other effects were held constant, the only effect of women's involvement in business and cottage industry shows a longer first birth interval (Table 4.4). Also, equally interesting is

Table 4.4

Cox Regression Results for Parity Probabilities when all the Socio-Economic and Demographic Variables are Considered, Nepal, 1991.

Variables	B (for first birth interval)	B (for second birth interval)	B (for third birth interval)
Residence (urban)	.2716*	.0058	.0557
Age of respondent	-.0224*	-.0024	.0200*
Age at first union	.0995*	-.0120	-.0225
Ethnicity (Brahmin + Chhetri)			
Newar	.1180	-.0892	-.2053
Mongoloid	.3132*	-.1092	-.1374
Other	.1439	-.0853	-.0154
Religion (Hindu)			
Buddhist	-.1744	-.0959	.0986
Muslim	-.2562	.2336	.5201
Other	-.0333	.0180	.2479
Education of women (0 - grade 5)			
Middle school (grade 6 - 9)	.1441*	.0520	-.0403
School Leaving Certificate (SLC or Gr. 10)	.1061	.1666	.0284
Post secondary	-.1219	.0357	-1.1401*
Education of husband (0 - grade 5)			
Middle school (grade 6 - 9)	-.0163	-.0433	-.1905
School Leaving Certificate (SLC or Gr. 10)	.1469	.1796	-.1081
Post secondary	.0094	.1396	-.0286
Occupation of women (agriculture)			
business + cottage industry	-.2617*	.0184	-.1833
service	-.1344	-.3416	-.3613
daily wages	-.0735	-.1680	-.2288
Other	-.5499	-.6474	-.2092
Occupation of husband (agriculture)			
business + cottage industry	.1697	-.0373	.0701
service	-.0156	-.1927*	-.1232
daily wages	.3303	.2304	-.3320
Other	-.3308*	-.1471	.2143
Cash earning by women (yes)	.0635	.0258	.0834
Sex of first child (male)	-	.0342	-.2807*
Sex of second child (male)	-	-	-.3323*
-2 Log Likelihood	17293.4	7146.9	1644.6
Model Chi-square	193.8	60.1	120.9
d.f.	24	25	26
N	1651	947	428

* significant at $P \leq .05$

the finding that those women whose husbands have "other" occupations (including students, the unemployed, seasonal migrants, etc.) conceive later than those whose husbands are involved in agriculture once the effect of this variable was isolated from effects of other variables (B= -0.331).

Most of the effects on the third birth interval also disappear once other factors are considered suggesting that the disappearing effects were not acting alone. Only the "age of respondent," "education of women" and "preference for sons" have significant effects on the third birth interval in this case. The finding that as the age of respondents increases, they tend to conceive early for the third time still holds true (B= 0.020).

When the effect of women's education alone is analysed, the result still shows that women with post-secondary education wait longer (chance of pregnancy lower) than those with elementary or no education (B= -1.140). Similarly, the finding that if the first or second born was a boy, women delay the pregnancy for their third child (B= -0.281 and B= -0.332 respectively) still gains support.

Analysis was also done by age group: for younger women aged 15-34 and for older women aged 35-49 (Table 4.5). When we look carefully at Table 4.5, it is clear that for the younger women, more factors have significant influences on the birth intervals than for the older group. For the younger group, when age increases, pregnancy is delayed for the first child (B= -0.024) and speeded up for the second (B= 0.019) and the third child (B= 0.036). As age at first union with husband increases for these women, the first pregnancy is quicker (B= 0.131). Mongoloid women in this age group conceive earlier than Brahmin and Chhetri women for the first baby (B= 0.268).

Younger women with post-secondary level education wait longer for the third child than those with elementary or no education. One interesting finding that emerges for this group is that women in the "other" category of occupation (which includes students, the unemployed, housemaids, etc.) wait longer before having their first baby than the women in agricultural occupations (B= -1.124). And younger women whose husbands are involved in a business or cottage industry conceive their first child earlier than those whose husbands are in agriculture (B= 0.251). But the women whose husbands are service holders wait longer for the second child than their peers whose husbands are in agricultural work (B= -0.245). Younger women also delay their pregnancy for the third child if their first or second child is a male (B= -0.373, B= -0.348 respectively).

For the older group of women (age 35-49), only two factors have significant effects on the first birth interval. For these women, as age at first union with their husband increases, they tend to have their first child sooner (B= 0.060). And if their husbands are service holders, the first pregnancy comes later (B= -0.398). None of the factors have significant influence either on the second or the third birth intervals.

Table 4.5

Cox Regression Results for Parity Probabilities by Women's Age Groups 15-34 and 35-49, Nepal, 1991.

	Age 15-34			Age 35-49		
Variables	B (1st birth)	B (2nd birth)	B (3rd birth)	B (1st birth)	B (2nd birth)	B (3rd birth)
Residence (urban)	.2264	.0296	.0888	.2757	-.1061	.0506
Age of respondent	-.0236*	.0193*	.0366*	-.0228	-.0136	-.0069
Age at first union with husband	.1306*	-.0192	-.0346	.0601*	-.0133	.0047
Ethnicity (Brahmin + Chhetri)						
Newar	.0311	-.0884	-.3209	3282	.0640	-.3567
Mongoloid	.2681*	-.0791	-.1301	.2681	-.0972	-.3710
Other	.1788	-.2148	.1470	-.0576	.2573	-.2662
Religion (Hindu)						
Buddhist	-.0220	-.0706	.1498	-.3466	-.2008	-.0082
Muslim	-.2337	.2797	.4252	-	-	-
Other	-.0773	-.0970	.4870	.0450	.0878	-.1310
Education of women (0 - grade 5)						
Grade 6 – 9	.1259	.0613	-.0282	.2352	.1997	-.0171
SLC or grade 10	.0631	.2108	.1512	.2851	-.0592	.1402
Post secondary	-.3976	.0445	-1.7049*	.5301	.0156	-.8837
Education of husbands (0 - grd 5)						
Grade 6 - 9	-.0582	-.0639	-.1694	.1501	.2397	-.0447
SLC or grade 10	.0804	.2259	-.2093	.3105	.3143	.0999
Post secondary	.0026	.0761	-.1002	.0923	.3093	.2281
Occupation of women (agriculture)						
business + cottage industry	-.1959	-.0226	-.2289	-.1472	.1985	-.1062
service	-.1885	-.2431	-.4226	.0931	-.1770	-.5778
daily wages	-.1702	-.0536	-.3313	.2789	-1.0710	1.0334
Other	-1.1236*	-1.1859	.9025	.9266	.3058	-.3114
Occupation of husbands (agriculture)						
business + cottage industry	.2510*	-.0401	.1201	-.2001	.0063	-.1679
service	.0618	-.2451*	-.1557	-.3977*	.0241	-.1424
daily wages	.3390	.2210	-.1144	.7585	.3243	-2.1657
other	-.2808	-.3335	.3413	-.7584	.7557	-.0251
Cash earning by women (yes)	.1201	.0797	.0621	-.1456	-.1451	.3203
Sex of first child (male)	-	.0203	-.3729*	-	-.0326	-.0464
Sex of second child (male)	-	-	-.3484*	-	-	-.2077
-2 Log Likelihood	13857.0	8458.2	4434.2	2604.0	2510.0	2281.7
Model Chi-square	182.2	34.0	65.2	53.7	22.8	36.8
d.f.	24	25	26	23	24	25
N	1403	998	654	287	277	266

Note: * significant at P ≤ .05 . "-" for religion variable signifies "no Muslims in this age group"

Discussion

The selected variables show various effects on different birth intervals; however, the first and the third births are the most affected by these variables. All the variables except for "cash earning by women" influence the timing of the first and the third births by shaping the length of birth intervals. But the second birth interval is not affected by ethnicity, education of women, education of husband, nor cash earning by women (Table 4.3).

Among other things, this study of birth intervals indicates possible fertility decline among women with different characteristic background. In the first scenario, when analysis was done for each independent variable, urban women having long third birth interval; higher age of women at first union with husband showing long second and third birth intervals; Newar women having a long third birth interval; Buddhist women showing a long second birth interval; grade 10 and post-secondary level educated women waiting long for the third birth; women with husbands' middle and post-secondary schooling waiting long for the third child; service holders and in "other occupation" women having a long third birth interval; women with husbands involved in "business and cottage industry" waiting long for the third child, in "service" waiting long for the second and the third child, and in "other occupations" waiting long for the second births, indicate that these women, probably, want less number of children. Thus their fertility may be expected to decrease eventually[8].

And the findings from the other scenario, the main equation, when the effect of each factor was analysed by controlling for other effects (Table 4.4), show that place of residence, current age of women, age at first union, ethnicity, education, occupation, and occupation of husband are very strong factors in determining the length of the first birth interval. Similarly, the current age of women, education, sex of first child, and sex of the second child turned out to be the most influential factors in shaping the length of the third birth interval. However, occupation of husband is the only strong factor influencing the second birth interval. The weak effects of other variables on the second birth interval may be an interesting topic to explore further in the future research.

Urban, Mongoloid women, and women with middle school education have higher chances of being pregnant for the first time. Also, the higher the age at first union the greater is the risk of being pregnant for the first time (Table 4.4).

Urban women may be more modern and outgoing. They may prefer modern marriages (the so-called "love marriages" or self spouse selection) rather than traditional arranged marriages[9]. This may indicate that rural women are more modest about their sex lives than their urban sisters. Furthermore, sleeping arrangements in rural areas may affect their fertility behaviour. In some rural areas, mostly in the mountains, the sleeping room is a common big room for the whole family (Fürer-Haimendorf, 1964). In other cases, mostly in the rural areas of South Nepal, rooms are divided by walls with open doors (no doors attached to lock the room). Thus, privacy for new couples is rare. Also, marriages are found to be more stable in urban areas compared to Nepal as a whole (Acharya, 1993). For all these reasons, the finding that urban women conceive earlier is not surprising.

Mongoloid women are by nature very frank, free, and modern and prefer late marriages. Moreover, traditionally, they are not confined to arranged marriages, and usually select spouses on their own (Fürer-Haimendorf, 1964; Hitchcock, 1966; Johns and Johns, 1976; Messerschmidt, 1976). Compared to traditionally arranged marriages, self spouse selected marriages are found to have greater coital frequency (Rindfuss and Morgan, 1983). Also, because some of the groups' cultures prefer cross-cousin marriages, they already know their future spouses and may have experienced close relationships. The findings of a study on the first birth interval among the Tamang women of Nepal suggested that the transition to family building within marriage depends on the familiarity between couples and on a woman's comfort in the marital environment (Fricke and Teachman, 1993). In addition, premarital sex is acceptable in these groups (Fürer-Haimendorf, 1964; Hitchcock, 1966; Johns and Johns, 1976; Messerschmidt, 1976; Macfarlane, 1976; Fricke, 1986; Fricke and Teachman, 1993). These facts may have enhanced their chance of becoming pregnant for the first child, compared to their Brahmin and Chhetri peers. The strong effect of ethnicity on the first birth interval is in line with the previous finding from Malaysia (Rindfuss et al., 1983).

Those women who have middle school education may be more modern, open and mature in age than those who have lower levels of schooling. Thus, the former may have a higher chance of getting pregnant than the latter. The delaying of first births by women involved in a business or cottage industry compared to those in agriculture may be explained by the fact that the former women need to spend more time in their work. Unlike women in agricultural work, they earn money in this occupation. But their husbands' occupations show different effects on the first birth. The category "other" under the husband's occupation includes students and the unemployed, as well as those associated with foreign military service, seasonal migration, and political work, which could have delayed the first births as they have to devote time for school, look for jobs or work away from home more often and for longer durations.

The higher risk of being pregnant for the first child as the age at first union with husband goes higher could be because women who are married at an older age may be more mature about and aware of their sexual relationships than those married at a younger age. Furthermore, since childbearing becomes more complicated as the age of women increases, and in particular for the first birth, older women may prefer to have their first baby as soon as possible. This finding supports the earlier research done in Jordan (Abdel-Aziz, 1983) and in Nepal (Fricke and Teachman, 1993).

On the other hand, women in the past (women in the older age group) tend to delay their first births. In general, when we look at the chance of being pregnant for women in the past and in recent years, chances for younger women may be higher than that for older women for several reasons. First, marriage patterns are changing slowly from traditional arranged to self-spouse-selected ones. Even in most of the arranged marriages these days, particularly in urban areas, couples have chances to know each other before they are married. Moreover, the media and women's development programmes (e.g. programmes related to health, nutrition, family planning and reproductive life, etc.) conducted by the national and international non-governmental organizations (NGOs and INGOs) may have helped younger women to better understand sex life. Obviously, such programmes were rare in the past. The reason for the greater fecundity of women today is also attributed to an improvement in health conditions and nutritional levels (Abdel-Aziz, 1983). This explains the delay of first births by women in the past.

The second birth is hardly affected by these factors. In Nepal, people seem to care less about when the second baby comes once they had the first one. The findings suggest that the second birth is not given much importance *vis-a-vis* the first.

When it comes to the third child, the decision seems to depend mainly on the sex of the previous two children. The finding that Nepalese women delay their second and third births if the previous child/children was/were male suggest that women do not wait long to have another baby if the previous child/children was/were female. Another important finding is that post-secondary educated women seem to delay third births, most probably to wait until the previous children are grown up. Moreover, these women may be exposed to family planning programmes through sources such as peers, courses in college/university, and the media. It is noteworthy that this factor has the strongest influence on birth interval. The finding also indicates that in the past, women preferred to have the third birth earlier than women today. One of the reasons for this may be that contraceptives were neither popular nor easily available in the past and that women had little control over their own reproductive lives.

When we look at the effect of ethnicity across the three intervals (Table 4.4), although Newar, Mongoloid, and 'other' women waited longer duration for the second and the third child/children compared to their Brahmin and Chhetri peers, these results were not significant suggesting ethnicity mediating through other social factors. Similarly, religion alone and husband's education alone do not make any difference in shorter or longer first, second, or third birth intervals. Unlike in other Asian countries, religion does not seem to play an important role in determining the length of birth intervals in Nepal.

The effects of women's education and husbands' education on birth intervals shown by the current research contradict some of the findings from the earlier studies done in other parts of Asia (Trussell et al., 1985; Nair, 1996) but support others (Hirschman and Rindfuss, 1980; Rindfuss et al., 1983). The findings imply that encouraging women to complete post-secondary education, to take up business and cottage industry as their occupations may in the long run bring their fertility level down. Similarly, opening up more jobs in 'service' or 'other' occupations rather than in agriculture, business, and daily wages for men (husbands) may be expected to bring down fertility of their wives at some point.

Contrary to expectation, the overall results indicate that cash earning (by women) is not an important determinant in shaping the birth intervals in Nepal. However, women in salaried jobs (service), daily wages, business and 'other' occupations seem to delay either the first or the second or the third births (Tables 4.3 and 4.4). This contradicting result may have something to do with the measurement of variables and their definitions in the survey. Further work is needed to investigate this finding.

Conclusion

The fertility behaviour of Nepalese women depends on many socio-economic, demographic, and culture-related factors. The findings show a strong link of various modernization and demographic variables to fertility. From the birth history presented here, it is clear that different births are given varied importance in Nepalese society. First births are given much more importance than the subsequent births[10]. Generally speaking, after the first birth, women seem to be eager to complete their reproductive cycle by bearing the second and the third child early, possibly to get involved in other work. However, the analysis of effects of individual factors on different birth intervals shows that women do not always conceive their second and third child/children sooner (with shorter duration of intervals) compared to the first ones and that many factors affect the delaying or the speeding up of the first, the second and the third births.

Although some of the findings contradict the results of previous studies from other developing countries, many others provide consistent support of earlier research. One of the most significant findings is that highly educated women seem to have control over their reproductive lives. It is found that fertility decisions also depend on women's place of residence, on their own and their husbands' occupations, and on the age when they first started to have sexual relationship with their spouses. In addition, cultural disparities among different ethnic groups have remarkable influence on birth intervals. Compared to younger ones, older women had longer first and shorter third birth intervals. This may be interpreted as younger women not waiting long for the first baby but delaying the third birth.

The birth intervals affect total fertility rate, in that, women who delay child bearing may consequently have low fertility. The findings from this study indicate that as more women achieve higher education in the coming years, fertility of Nepalese women may be expected to decline. Encouraging women for higher education may be the most influential way of slowing down the fertility of Nepalese women.

The findings also suggest that by giving opportunity to women in employments such as business and cottage industries rather than in agriculture-related occupations, Nepal could have higher chance in bringing down its fertility level. Similarly, the steady increase in the number of people who accept family planning ("using some kind of contraceptives") also indicates people wanting fewer number of children than in the past. This trend indeed suggests possible further fertility decline of Nepalese women in coming years. Furthermore, the findings that urban women and those women who are young in age delay their third births also suggest that these women's knowledge of family planning on the one hand and the availability and accessibility of contraceptives on the other (a clear indication of an advantage of being in urban areas and having interactions with different media and people as young women) have significant impact on birth intervals. And women who started the first union at young age were found to delay their first births. This is an important finding as well because if first births are delayed, subsequent births will naturally come later than in the case when first births come earlier. This will certainly affect the total fertility of women.

Although it appears that the first-born is considered to be the most important, be it a boy or a girl, a preference for sons is still found to be a strong cultural norm. A pronatalist norm such as this one may enhance fertility of Nepalese women because women may want to continue child bearing until they give birth to a male child. The reasons behind such attitude should be carefully studied and analysed to find a way to change the attitude without hurting cultural beliefs and practices of different ethnic groups. The policy planners of the country need to give serious thoughts on the findings such as discussed in this chapter before they plan the population policy and development of Nepal.

In general, the empirical test of many variables indicates possible fertility decline in Nepal, especially for the younger generation, for urban women, for women employed in cottage industry and business, and for educated women. Fertility decline may also mean possible improvement in child health, mother's health, and mortality, consequently, resulting in higher life expectancy, which eventually follow the demographic and epidemiological transitions.

Endnotes

1. Since the mean ideal number of children for married Nepalese women in 1991 was 3.1 (Hayes, 1993) three births are considered for analysis.

2. In some ethnic groups, marriage does not represent the beginning of exposure to intercourse. In such groups, new brides return to their natal home after marriage ceremony. They start to live with their husbands only after another special ceremony that may take place a year or more later. And in other communities, girls are given away in marriage as early as possible, because virginity is considered to be the most prestigious requirement in a marriage. In such communities, the young brides are brought back to parents' home until she is mature enough to live with her husband. These are the reasons why 'age at first union' was selected for analysis rather than 'age at marriage.'

3. However, in many cases older relatives also tend to persuade young married women to have children soon after marriage.

4. The "current use of modern family planning method" is increasing slowly from 2.9 percent in 1976 to 15.1 in 1986 to 35.4 in 2001 (Ministry of Health, 2002).

5. Care has been taken to combine groups (at least for the three major categories) with similar cultural background as far as possible.

6. Censored and truncated cases are those where women have not yet completed their reproductive cycle. Including only those women who have completed their reproductive cycle do not contain sufficient cases for analysis, especially for variables such as "ethnicity" and "religion" where certain groups are high in number.

7. In 1991, the mean age at marriage for Nepalese women was estimated as 18 years (Central Bureau of Statistics, 1995).

8. After remaining almost stagnant for three decades at around 6, the total fertility rate (TFR) of Nepal declined to 5.6 in 1991 and then to 4.6 in 1996 (Central Bureau of Statistics, 1995; Ministry of Health, 1997).

9. A behavioural change has been noticed in the Kathmandu Valley and other cities since about two decades ago. Even in arranged marriages, couples are allowed to date long before they are married in urban areas among some ethnic groups such as the Newars so as to give chance to let them know and understand each other better. Such a behavioural change was also seen in a semi-urban area Kirtipur in the Kathmandu Valley among the Newars (Shrestha, 1998). The study also found a shift in the marriage pattern from parental arranged to a jointly (by parents and children) decided one, and to a self-spouse selected one. As a result of more familiarity and quicker intimacy with their spouses, the first birth interval of women in the study was found to decline steadily.

10. The importance of the first births among the Nepalese societies, particularly among the Tamang societies in Nepal, is discussed by Fricke and Teachman (1993): a first birth enhances a woman's social status and a new phase in the cycle of family and household formation processes is added. Two strong reasons for giving a high importance to the first born, specifically if it is a boy, are the positive values of children to household and lineage of the family.

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5

Chapter V

Socio-Cultural Practices and Women's Autonomy among Nepal's Ethnic Groups and Their Effects on Fertility and Family Planning

Introduction

Nepal is a multi-ethnic, multi-cultural, and multi-lingual country. Such diversities make the country rich in culture and heritage. However, this also poses a threat to the effective implementation of health and development plans. Because one common plan may not be applicable to all the traditional norms of different cultures. In spite of a substantial number of anthropological studies done in the country since it opened its door to visitors in the 1950s, there is still a dearth of information on the social traditions and lifestyles of Nepal's indigenous women. Despite such diverse cultures, most often, social scientists (both from within and outside the country) have been portraying Nepalese women as a single group. The customs, lifestyle, and women's status and autonomy vary among ethnic groups; therefore, fertility and other demographic behaviours also vary. Such diversity, no doubt, has a significant impact on Nepal's demographic and epidemiological situations. This chapter looks at socio-cultural differentials among some of the major ethnic groups existing in Nepal and the impacts of varied socio-cultural practices and differential autonomy among women on fertility. In this sense, culture is an exogenous factor that influences varied behaviours, including fertility: the more autonomy women have, the lower their fertility, consequently, leading the current second stage to the third stage of demographic and epidemiological transitions. Therefore, the fertility transition of Nepal will depend largely on the combination of culture and female autonomy. The current chapter will focus on this particular aspect of the Conceptual Model presented in Chapter I.

The first section of this study looks at the literature on the relationship between cultural factors and fertility behaviours. The second section introduces some of the major ethnic societies in Nepal. The third section deals with the theoretical bases and the data analysis. And finally, the discussion and conclusion of the findings is given in the last section. In this study, autonomy of women is defined as the freedom of expression, movement, and decision-making in the family and the community.

Literature Review

In the early days when the demographic transition theory emerged, social scientists did not give much attention to the role of cultural factors as determinants of demographic change (Goldstein, 1976). With the studies of Coale (1969, 1973), however, this situation changed; currently, there is a growing interest in the study of cultural factors influencing fertility. In the 1980s, social scientists such as Cain (1984) and Caldwell (1986) acknowledged the impact of social class and caste on fertility in the context of developing countries. Among other things, the degree of autonomy of women in different social classes and castes may make a significant difference on the fertility and family planning preferences of women. Mason (1987) argued that the extent to which women have autonomy from men's control in their day-to-day lives or those women who are economically independent from male family members, affects their age at marriage, their desires for children, the costs of raising children, and the use of contraception.

Caldwell and colleagues (1982) found that in Sri Lanka fertility varied considerably by ethnic groups, the Moors (Muslims) having the highest fertility. Their study also found a higher fertility for Muslims in Bangladesh as opposed to Hindus, but to a lesser extent.

Most studies, including those of Caldwell (1986), Cleland and Jejeebhoy (1996) and Visaria (1996), measured autonomy of women in terms of education or employment of women. Educated girls tend to marry later, have fewer children, and have more autonomy. However, studies in the developing countries also show that the differential between the uneducated and the "less than primary educated" girls in marrying later and wanting fewer children is not significant. In Nepal, only post-secondary educated women showed a significantly longer third birth interval as compared to illiterate women when the effects of socio-economic, demographic and health-related factors were controlled (Suwal, 2001).

In India, the gender disparities in educational levels of two areas, Uttar Pradesh and Kerala, are also found to be influenced by the cultural differences of these places (Cleland and Jejeebhoy, 1996). In Uttar Pradesh where women's status and autonomy are generally low, gender disparity in education is found to be significantly higher than in Kerala where women have better position. Consequently, Kerala has a very low fertility (crude birth rate of 18.0 per 1000 population) and Uttar Pradesh high (crude birth rate of 32.1 per 1000 population) (Registrar General, India, 2000). Even in a developed country such as Canada, being an aboriginal was associated with higher than average fertility (Suwal and Trovato, 1998). Since other socio-economic factors were held constant in this Canadian study, cultural factors probably played a role in the observed fertility differences.

In South Asian countries, age is found to play an important role in the autonomy of women. Basu (1996) shows higher age dominating women's decision making on domestic matters as well as on treatment of sick children. The age effect, perhaps, is an outcome of changed status of women as they grow older, shifting from a new daughter-in-law's status, finally to a mother-in-law's status in the family. Although Basu overlooked it, what is also clear from her data (Basu, 1996: 54) is the fact that women in Tamil Nadu are more autonomous than those in Uttar Pradesh. Despite both places being in India, different cultural practices and women's status must have affected their autonomy. Cultural practices and education of women affecting fertility are reported by another study (Visaria, 1996) done in India. Both "contact with natal kin" and "female education" showed inverse relationship with fertility. Contact with natal kin did not show association with contraceptive use. However, income autonomy and personal autonomy were found to be correlated.

Nepal's Case

In Nepal, the diversity of cultures is such that in some cases, women have more freedom, authority, and decision-making power at home and in the community than is the case for other cultural groups. In the more orthodox cultural groups, women are almost totally subordinate to men. Couples in some cultures spend most of their life together while for some ethnic groups, married life does not always mean spending time together with spouses. Some cultures prefer polyandry, others polygamy, the rest monogamy. Kinship and relationship with one's natal family are highly prioritised in some cultures but not so in others. Sometimes it goes to the extent that natal family not only protects their married daughters and sisters when needed but also interferes in family matters if the girls are not treated well at their spouse's house; in other ethnic groups, natal family members do not interfere or are powerless even when the daughters and sisters are in trouble. Divorce, remarriage, widow-marriage, and cohabitation are viewed differently by different cultural groups. The same is true with the chastity of girls before marriage, some groups giving it a high priority and others less or none. The age at first marriage for girls would be lower in the more orthodox cultures, consequently resulting in a high fertility. In some cultures sons are highly valued, while in others both sexes are equally valued. These cultural differences may play important roles in fertility differentials in Nepal.

Above all, the diverse cultural practices may enhance or lower the autonomy and status of women in terms of freedom of expression and movement and the respect they receive in their family and the community. In the hills and valleys, although, women are more often preoccupied in winnowing, sifting, grading, and storing kinds of work, they also work side by side in the field with men. Most women from various ethnic backgrounds in the Terai areas (Southern Nepal), normally, do not go to the field. They take part in agriculture-related work at home or at landlords' home and also drop lunch off in the field for men. The "Purdah" system practised in the Terai may have prevented women to work in the field where elder males of the same family and other male labourers work. Women remaining virtually out of touch with the outside world and thus, being ignorant of the so-called modern facilities may be common among such groups. The conditions of the so-called low caste and untouchable groups in the Terai are even worse.

The situations among the Kathmandu Valleys' Newar ethnic groups are different. Contrary to the findings of other South Asian countries, among the Newars, in general, women with socially low status (so-called low-castes) have more freedom in the family, in their movement outside of home, expressing and mixing freely with the opposite sex, and in household decision-making. About the role of education, it has been found to enhance women's autonomy in most South Asian countries. In Nepal's case, the situation is more complex in that the most autonomous groups in the country such as the Mongoloid and the Tharus of the Terai have relatively low literacy. A brief discussion of findings from previous studies on different cultural groups in Nepal is presented below.

Thapa (1989) found a strong independent role of ethnic factor in family formation in Nepal. His findings convey strong group specific fertility behaviours among Nepalese women. For example, the Tibeto-Burman language groups had higher age at marriage and more freedom of spouse selection, divorce, remarriage, and widow-marriage compared to the Indo-Aryan language groups including the Muslims.

An earlier study (Goldstein, 1976) done in Limi, a mountainous valley in the west Nepal, reports how women practising fraternal polyandry operates to depress population growth by producing a significant number of unmarried girls. Although, the never married single girls gave birth to out of wedlock children as their culture allowed them to, the total births per woman was low in number. Fraternal polyandry is practised in most cultures of Tibetan origin in highland Nepal, mainly for maintaining the family's major resources such as the land and animals intact. Nevertheless, its demographic implications may be far-reaching. Although, polyandrous marriage is not practised in Nepal with an intention to lower fertility (Goldstein, 1976; Ross, 1984), its impact on fertility should not be overlooked.

Ross (1984) unveils a very interesting finding about the cultural differences influencing fertility of women in a rural village in west Nepal, near Limi. Her study-groups comprised of Dingaba women who are Buddhists and speak Tibeto-Burman language, and whose custom is to marry late and practise fraternal polyandry, and Thakuri women (one sub-ethnic group of the Chhetris) who are Hindus by birth and whose cultural practise is to marry very young, often with men double their age. Both groups' fertility levels were found to be similar. The factor affecting Thakuri women's fertility, the seeming mystery, is their unique culture in the particular area. First, because of bride-price, Thakuri men waited long to save money before getting married. Second, Thakuri men preferred virgin girls, as a result of which the age difference between the bride and the groom was about 16 years or more. Thus, many women were widowed before they reached 45 years of age. In addition, Dingaba women remarried after a spouse's death whereas only a few Thakuri women did so, resulting in post-widowhood celibacy for the latter women. In the end, although Thakuri women married monogamously at a very young age, because of their cultural practices such as marrying much older men and widows not remarrying often, brought their fertility to almost the same level as that of Dingaba women who married late and remained in polyandrous marriages. Ross acknowledged that, even a slight change in one or both cultural practices, for example, a decrease in the age gap between the Thakuri spouses or Dingaba men and women marrying monogamously, would affect their fertility to a great extent.

The lactating behaviours and birth spacing of two distinct groups, the Tamangs and the Kamis of a rural village situated at an altitude of 6000 feet above sea level in Nepal are discussed by Panter-Brick (1991). The Tamang women, Buddhists by birth, moved around a lot, travelled to different places, worked in the field even while pregnant, and took babies and toddlers to the field. They breastfed more often than Kami women according to children's demand and need. The duration of breastfeeding was also longer (up to 35 months) for Tamang children compared to Kami children (up to 25 months). The Kami women, Hindus by birth, blacksmiths by profession, and the so-called untouchables, stayed home and fed supplementary food to children more often than the Tamang women. The former women had shorter birth intervals, thus, needed to wean earlier than the Tamang women. The other cultural and lifestyle factors that affected the two groups' fertility behaviours were the sleeping arrangement and natal home visit. Tamang women often slept separately from their spouses because men needed to sleep in cowshed to look after the cows. Also, women frequently visited their natal home and stayed there as their usual cultural practice whereas Kami women slept with their spouses and did not practise visiting of their natal homes. Unsurprisingly, Tamang women have longer birth intervals than Kami women.

Age at marriage is influenced by religious and cultural practices in Nepal (Thapa, 1989; Aryal, 1991; Thapa, 1997). Aryal's study (1991) shows that religious and cultural beliefs are strong determinants of age at marriage, which affects the fertility of Nepalese women. Even among the same ethnic group, the age at marriage were found to be different for Hindus and Buddhists (Aryal, 1991). By using the 1986 Nepal Fertility and Family Planning Survey, Aryal showed that Buddhist Mongoloid women's mean age at marriage was two years higher (20 years) compared to Mongoloid women who practised Hinduism. Similarly, Newar women who practised Buddhism had 1.5 years higher mean age at marriage (18.7 years) as opposed to those whose religion is Hinduism (17.2 years).

Thapa's recent study (1997) compares all the 75 districts of Nepal in terms of the roles of age at marriage and other socio-economic factors on family formation. Ethnicity was found to be a strong determinant of age at marriage. On the surface, marriage may seem to be the beginning of motherhood in Nepal, as Thapa acknowledged. But in fact, the mean age at first birth is some three years later than the average age at marriage in the 1996 Nepal Family Health Survey data that Thapa used. On average, marriage takes place at age 16, whereas the first birth occurs at age 19 on average (Ministry of Health, 1997). By using the Nepal Fertility, Family Planning and Health Survey, 1991 data, Suwal (2001) shows that the average first birth interval for Nepalese women is almost four years.

A number of cultural factors may be responsible for the generally long interval between marriage and the first birth. First, cohabitation does not begin immediately after marriage for many Terai ethnic groups and for some hill Mongoloid groups. Girls belonging to these ethnic groups return to their natal home for a year or a few years according to their respective cultural practices, before cohabiting with their husbands. Second, in most arranged marriages, couples tie knots as total strangers, thus, they may need more time than anticipated to develop intimate relationship. Third, although, in most societies, the elder family members and relatives of both the bride and groom may encourage the couple to have a child as soon as possible, there are people in orthodox societies, who may still think it to be shameful to bear a child too soon. Fourth, as mothers-in-law are strict, demanding, and the most powerful personality in the family (especially in the orthodox, Hindu families), daughters-in-law may feel intimidated by them and so, may spend more time at their natal homes or they may feel threatened at home to have a close relationship with husbands. A similar situation was encountered in Bangladesh by Caldwell and colleagues (1982) where powerful and dominating characteristics of mothers-in-law may have been the reason for low use of contraceptives when the mother-in-law was present in the household.

Regarding the autonomy of women, a recent study (Barber et al., 2001) found that participation of women in any voluntary association such as credit groups, women's groups, agricultural groups, and youth groups increased permanent contraceptive use among the couples in the Chitawan Valley in South-central Nepal. Similarly, Axinn's study (1992) of Tamang women showed that women's participation in Small Farmers Development Programme (SFDP) increased contraceptive use aimed at terminating childbearing. Encouraging fertility limitation is only a small aspect of SFDP whose main objective is to improve living conditions of small farmers by providing income-generating activities. Among other things, children becoming more and more of an economic burden and women influenced by SFDP peer members for having small family were reported. Axinn argued that the highly successful programme such as SFDP in Nepal "may provide one component of a solution to South Asia's persistent problems of population growth and poverty" (Axinn, 1992: 410).

The review of literature above gives some hint about the different cultures and fertility behaviours of some of the ethnic groups existing in Nepal. It becomes important to have some additional background information of the major societies in Nepal to better understand the fertility behaviours of women in these societies.

Women's Role, Status, and Autonomy in Some Major Ethnic Groups of Nepal

Women in Gurung Society

The Gurungs belong to one of the Mongoloid ethnic groups in Nepal. Many Gurung women, the dwellers of hills in Central West Nepal, are household-heads because of the long absenteeism of their spouses. Most adult males have been working for the Indian Army and the British Gurkha Army for two centuries. All decision making in a family is thus done by women until men retire and come back home. As told by educated Gurungs, they practised Buddhism in the past. Although they are still Buddhists in their hearts, because of the Sanskritisation and Hinduisation policy of the monopoly Panchayat government of Nepal (1961-1991) the Gurungs started to call themselves Hindu to seek status in society and better employment[1].

Among the different ways of marriages the Gurungs prefer matri-lateral cross-cousin kind: a man marrying his mother's brother's daughter (Messerschmidt, 1976). Such custom is disappearing slowly among the educated Gurungs who prefer to marry by choice. Cross-cousin marriage custom was developed to keep the bond between two families strong. Elopement and cohabitation are also common among the Gurungs. However, cohabitation is disapproved by the Gurung society and is practised only if the man and wife come from different castes.

The Gurungs have a special kind of organisation called *rodi* or *rodi ghar* (*rodi* house) where boys and girls meet, sing, and dance. Some call *rodi* as "youth associations," some as "club for boys and girls," some as "communal house" and "young people's meeting house" (Bista, 1976; Messerschmidt, 1976). As told by Gurungs, a "*rodi*" initially signified a rest house or entertainment place for all those who want to relax and enjoy after work by gathering, singing, dancing, and telling jokes, irrespective of sex and age. As time changed *rodi* membership was determined by age and sex. As Messerschmidt observed in the 1970s, *rodi* is essentially a girl's institution to which boys are invited. Girls stop joining *rodi* either after marriage or after their first child is born. The girls, as members of *rodi*, participate in various group activities. The effect of modernisation, perhaps, changed the theme of *rodi* from its initial stage. Messerschmidt observed that at times parents gave material and financial assistance to the girls, and also chaperoned her and her friends on short and long trips to visit boys or festivals in other villages. However, as told by Gurungs of Pokhara town, *rodi* is limited to rural areas.

We clearly see the autonomy of women in the Gurung society. There may be limited division of labour and role model among males and females. Autonomy and freedom similar to Gurung women may be unthinkable for Brahmin, Chhetri, and Newar women, whose cultures are orthodox in nature (Bista, 1976; Messerschmidt, 1976).

Women in Limbu Society

The Limbus of Nepal, a Mongoloid group, live mostly in the Eastern hills. Their dwellings in the hills, known as the "Limbuan," and the highly autonomous Limbus became parts of a larger political and economic system after the country was unified in the eighteenth century (Jones and Jones, 1976). Slowly the Limbus lost their precious land to the Brahmin migrants. The recruitment of the Nepalese hill men by the British

Army and the Indian Army, thus, became a big economic relief to the Limbus. Thus, many Limbu households did not have adult males at home, for two centuries. The Limbu women were entitled as household heads and all sorts of decision making fell upon them.

Unlike Brahmins, Chhetris, and Newars, Limbus do not choose to live in extended families. Although girls and boys are treated equally in a family, Limbus have strong desire to produce sons because of their land inheritance system. The eldest son is entitled for his father's titles but the youngest son inherits a father's house. Limbu women do not inherit parental property but keep their own personal funding.

Marriage is not allowed within four generations of someone's mother's clan. Bride-price is paid by the groom party and gift exchanges between the two parties go on for years. Bride-price is not looked upon by the Limbus as a cost of a bride but as a compensation to the parents for the loss of their loved one and her service. Parents keep the bride-price in most cases, but may give a portion to the girl as her personal funding. The bride-price does not ensure that the girl appears on her wedding day. She may change her mind to get married with the person, in which case the parents need to return the bride-price. Most Limbu girls spend a few years or until the first child is born at their natal home. Unlike in other orthodox ethnic groups, they prefer to give birth at natal home in the presence of mothers rather than mothers-in-law (Jones and Jones, 1976).

Marriage instability and divorce are very common among the Limbus. They also have a system called *jari* where a man takes away a woman married to another person. The man who gets married in such a way needs to pay money to the previous husband as compensation. Limbu women are free to select their spouse and leave him if they wish. Young men and women mix freely and occasionally during *Dhan Nach* (Rice Dance) where they make circle hand in hand and sing together. Men and women may take opportunity to select their lovers and spouses during the dance.

Widows are not looked down upon in their culture. Widows are often seen as powerful figures in their own right in Limbuan (Jones and Jones, 1976). A widow marrying her husband's younger brother and a widower marrying his dead wife's younger sister are common among the Limbus. Polygamy is also practised.

Physically strong and hard working Limbu women may look like being subordinate to men in the patriarch Limbu society. She distributes food to other family members first and eats last. However, women are treated like a 'queen' after a child-birth and called by special name (Jones and Jones, 1976). Relatives and friends visit with food items. Men respect women for their reproductive role and domestic labour. Men appreciate and praise highly of women's economic contribution in the family. Elderly women's advice is always respected.

Limbu women have high autonomy outside her home as well. They would walk for hours without male escorts to visit village festivals. They also sell varieties of cooked and uncooked food or liquor or handmade goods during festivals and thus make money for their own use (Jones and Jones, 1976).

Women in Rai Society

The Rais and the Limbus are collectively known as the *Kiranti*. The ancestral home of the Rai is the Eastern hills and mountains of Nepal. Just like their peers, the Limbus and the Tamangs, a large number of Rais live in Darjeeling, a hill-station that Nepal handed over to the British regime of India as a result of *Sugauli* treaty in 1816.

Rai people's main source of income is the military employment, mainly in the Indian and the British Gurkha regiments. Often, the Rais migrate seasonally to the lowland towns to find temporary work. The religion of the Rais is neither Hinduism nor Buddhism. They worship their ancestors.

Women have freedom in Rai society. Girls are free to choose their spouses. Marriage is monogamous and is either by arrangement or by capture, elopement or by mutual agreement of both the man and the woman. Marriage is allowed in one's lineage after seventh generation from father's side or after third generation from a mother's side (Bista, 1976). The groom's side pays bride-price to the bride's family, and the groom also gives gifts of jewelleries and clothes to the bride. The bride's family gives dowry of household items, domestic animals and any other thing that they can afford. Rai girls spend a year or a few years at natal home after the marriage ceremony. But the boy and the girl are free to meet whenever and wherever they want to during this period. According to their custom, a man can marry his elder brother's widow, his demised wife's younger sister or his niece (wife's brother's daughter) (Bista, 1976). If he marries another man's wife, then he needs to pay money as compensation to the former husband.

Premarital sex or becoming pregnant before marriage is not socially disgraced. Most of the time, the man who impregnated the woman is expected to marry her. If not, he will pay compensation money for delivery and so on. The woman is free to marry someone of her choice later (Bista, 1976). In many occasions, the brothers of a woman may beat up the man if he is not willing to marry the pregnant girl (McDougal, 1979).

Rais do not live in an extended family. They take their inheritance share and live separately from their parents once they start living with their wives. They have strong social unity (Bista, 1976). McDougal's (1979) study on Kulunge Rai, one clan of the Rais, reported the following: children of both sexes are preferred and loved in the Rai society. However, if only one child is expected in the family they prefer to have a son. In spite of non-use of modern family planning device, the spacing between two children in most cases, is more than two years. There is no restriction on sexual intercourse once the wife feels well after childbirth.

Girls are not restricted in their movement outside the home. Like their Gurung and other Mongoloid peers, they mix freely with boys and take part in singing and dancing gatherings in the evening. Men talk and joke about sex-related topics with girls freely except with their sisters and cousin sisters whom they need to show modesty. Women have strong bond with their natal family. Their brothers always take care of them and make sure that the sisters are well treated at their husbands' home. Women have their own funding. They may earn money by selling goods and liquor or working in other's field. Her husband may borrow money from her but needs to repay later. Sisters marry in order of age. If it so happens that a younger sister marries ahead of her elder sister, she needs to pay a fine to the elder sister.

Kulunge Rai men think their wife as a true 'friend'. There is no wife beating among them. Married women talk and joke freely with other men, and husbands join them sometimes. Certain tasks are divided between a husband and a wife but in most cases, they work side by side. Being self-reliant and having a strong character, a Kulunge wife is not easily intimidated by the opposite sex. Twenty-five percent of the wives in McDougal's study area were found to be older than their husbands. Girls, in general, are considered to be hard workers while boys lazy.

Women in Sherpa Society

Sherpas, the Buddhist highlanders, migrated to north Nepal from Tibet about two centuries ago. Sherpas do not live in joint-family system, except for the only son or the youngest son. Thus, each primary family lives in a separate household. Premarital love-affairs and sexual relationship is allowed in their society. Although traditionally, all the members of a Sherpa family sleep in one large living room, girls are free to receive visits from their lovers at night. Having one or two lovers before a Sherpa girl really gets married is common. She can even bear a child from her unmarried lover. The parents of the girl usually bring up her child without any objection (Fürer-Haimendorf, 1964).

A girl receives dowry from her parents and relatives on the occasion of her wedding. She may continually receive gifts from her parents, even a share of parent's property. Like in a few other mountain ethnic groups, polyandrous marriage is the most popular one among the Sherpa girls. The reasons behind such marriages are the prevention of fragmentation of property, especially land and house, and also the fostering of the solidarity of brothers. Sherpa women think that polyandrous marriage improves their economic prospects along with an advantage of having a young husband in later life. Polygamy is also practised in some rare cases (Fürer-Haimendorf, 1964).

According to Fürer-Haimendorf (1964), the youngest daughter in a family, like that of the youngest son, has a greater right to her father's house than her elder sisters. A Sherpa husband and a wife are equal partners in a household. Both men's and women's work are valued equally. Men do not treat their wives as subordinates. Sometimes men and women do similar kind of work without hesitation. However, after the age of twelve, boys are taught how to graze yaks by their fathers and girls help their mothers in the kitchen. Wives handle the household economy. Sherpa wives are equal partners to their husband both at home and outside. They mingle freely with outsiders irrespective of the outsiders' sexual orientation.

Children of both sexes are treated with love and gentleness. When children grow up, there is openness between parents and children about sex. Unlike in Hindu society, a mother-in-law does not expect her daughter-in-law to serve her. Instead a mother-in-law accepts that a daughter-in-law should be self-reliant and independent, and two married couples cannot live under the same roof for a long period of time (Fürer-Haimendorf, 1964).

The above observation was made in the late 1950s and the early 1960s. The autonomy and status of Sherpa women are much higher these days as a result of change in lifestyle. Because of mountaineering development and tourism industry, an ever growing number of women are involved in various jobs including "mountain guides" and also for the same reason, women entrepreneurs are increasing, especially as the owners and managers of lodges, restaurants, and shops. They are not only guides but also mountaineers themselves, reaching top of many high mountains[2]. Many of these women along with men have also migrated to Kathmandu as entrepreneurs.

Women in Magar Society

The magars of Nepal, a Mongoloid group speaking Tibeto-Burman language, live in the central part of Nepal, mostly in the hills. Since 1815, Magar men have been serving British Gurkha Brigade along with the Gurungs, the Limbus, and the Rais of Nepal. Thus, apart from agriculture, the extra income of the Magars come from the military service. Magars live in nuclear small families. Their marriages are mostly arranged by parents. Until recently, marriages used to take place at an early age. Marriage by elopement is also common. Magars also have a *jari* system where a married girl runs away with another man and she is then called a *jari* (Hitchcock, 1980). In such cases, the new husband must pay compensation money to the previous husband. Marriage by abduction also occurs occasionally for financial reasons. In such marriages, the man and the woman know each other, usually the abductor being someone her parents had selected (Hitchcock, 1980). Magars prefer to marry their maternal uncle's daughter.

According to Hitchcock (1980), a woman receives gift or dowry called *pewa* from her parents during her marriage. A *pewa* may consist of livestock such as cows, goats, chickens, buffaloes and kitchenware, jewellery, and also land if parents have enough land. A woman is the sole owner of *pewa*. Women have less freedom of movement than their husbands. But many domestic works are done by both husband and wife. Wives also accompany husbands when they go fishing in group. Although the Magars practice most of the Hindu rituals and thus, men cook meals when their wives menstruate, Magar women have relaxed relationship with their mothers-in-law and husbands unlike in some orthodox Hindu households. Wife beating and wives committing suicide were not heard among the Magars (Hitchcock, 1980). Most marriages are monogamous. Because separation and divorce are easy and common, husbands treat their wives well if they wish to keep them (Hitchcock, 1980). Women work very hard. Children are loved and cared well and are taught to show respect for their parents. Brothers look after their married sisters and make sure that they are treated well in their husband's home (Hitchcock, 1980).

Like the Gurungs, Magar girls and men gather in *rodi*, and sing and dance. A middle- aged person usually has a *rodi-ghar*, a room or hut where the youngsters gather (Hitchcock, 1980). The songs are usually sung in groups of men and women with one leader in each group. And the songs called *Dohari* are sung in a 'question and answer' style, the lyrics mainly dealing with love and marriage.

Women in Tamang Society

The word 'Tamang' means horse traders in Tamang language that belongs to Tibeto-Burman language group (Bista, 1976). Tamangs are Buddhists and believed to have migrated from Tibet. But many Tamangs claim that their ancestral home has been nearby hills around the Kathmandu Valley (Fricke, 1986).

Tamang brothers and sisters have special relationship of caring and supporting each other. Tamang men are free to claim their inheritance share with their father and live separately after the age of 16. Nonetheless, they usually separate from parents after their wives come to live with them (Fricke, 1986). Death is given the greatest ritual attention and importance of all the transitions in life (Fricke, 1986: Holmberg, 1989). Tamangs do not consider a newborn baby as a real human being until three days after the birth (Fricke, 1986). As in the Magar households, children are desired and loved in Tamang families. Pregnant woman continues physical work until she gives birth. A new mother does not resume work until at least a week.

Marriages are monogamous but in cases where men can afford and when a wife cannot produce a son, a man may marry a second wife (Fricke, 1986; Holmberg, 1989). In rare occasions polyandry is also seen (Holmberg, 1989). Divorce is common and remarriage for a woman is not disgraceful. Tamangs practice cross-cousin marriage. Usually a man marries his mother's brother's daughter (*mama cheli*), the marriage is arranged by the parents. Fricke (1986) claimed Tamang marriage as having no preference for either the mother's or father's side in choice of a cousin as spouse. Other forms of marriages are 'mock' capture and elopement.

Similar to the custom of the Rais, a younger daughter is married off later after an elder daughter. A younger sister has no choice but to elope if she wants to get married before her elder sister (Holmberg, 1989). A man and a woman elope either to avoid a marriage expense or when a formal arrangement is refused by senior family members. In Tamang society the bride's side is called "wife-givers" and a groom's party "wife-takers." Marriage is considered a vital event and usually takes place when youths are about age 20. A bride usually returns to her natal home after the ceremony and joins her husband a year or more later (Fricke, 1986).

Usually, a Tamang household comprises of a man, his wife, and unmarried daughters and sons. A woman of any other ethnic background does not have to change her surname if she marries a Tamang man. A woman does not lose her autonomy after marriage. She is the one who handles the household money. Holmberg (1989) observed Tamang women occupying a privileged position in negotiations and communications in a household and outside upon which all intercourse depends. A woman's inheritance includes her *pewa* received during and after marriage, of which she is the sole owner. Depending on the economic status of her parents the *pewa* may include cash, jewellery, land, clothing, household goods and domestic animals (Fricke, 1986; Holmberg, 1989).

Tamang women's dual affiliations due to cross-cousin marriage and their unique powers derived from such relationships are recognised by many (Holmberg, 1989). Men also have special obligations of looking after his sister's children, among whom the male child is their potential son-in-law. The value given to children as a future asset and as those who link families through cross-cousin marriage has been reduced recently. Because of reduced size of land-holding and a custom of sharing inheritance among the sons, Tamangs want less number of children these days (Fricke, 1997).

Young men and women express their feelings for each other during singing sessions. Such sessions take place in village festivals and during various family event celebrations. Women and men each form singing groups and start exchanging questions and answers by way of singing. Sometimes this may lead to elopement. Premarital sex is not a taboo in a Tamang society. In case a woman becomes pregnant before marriage, she would be pressured to name the man who impregnated her, and the person is expected to marry her (Fricke, 1986). If the person is already married and refuses to take her as a wife, he is responsible for the upbringing of the child. It may also happen that a husband accepts a child who is not his own. Fricke (1986) found a case in his study village where a Tamang man accepted a child of his wife even from a European man doing research in the village.

Tamang girls are considered to be soft at heart, simple and innocent, unaware of selfish motives of cunning people. Many young Tamang girls are manipulated into believing that they are going to have better lives and then are later sold to brothels in Bombay and other Indian cities.

Women in Brahmin and Chhetri Societies

Brahmins and Chhetris of Nepal are mostly hill dwellers. They, along with the Rajputs, migrated to the hills of Nepal from India some seven to eight hundred years ago when Muslims invaded Hindus (Bista, 1976). There are Brahmins in the southern Terai belt of Nepal as well, who are specified as Terai Brahmins in the census. They migrated to the Terai much later than the hill Brahmins. Currently Brahmins and Chhetris are collectively a dominant group in Nepal politically and also as a percentage of the total population. They speak the 'Khas' language that was known as 'Gorkhali' language until 1933, eventually called 'Nepali' language, the *lingua franca* of Nepal (Malla, 1989). They put themselves on the highest-class level in the Hindu hierarchical caste system.

Women in Brahmin and Chhetri societies are treated like subordinates by men. However, mothers-in-law are powerful figures and daughters-in-law need to obey them. Sons are given higher priority and in general, are given more care and facility than daughters for several reasons including the son's role in funeral rite and 'after death' ritual, and as future assets to the parents. Nevertheless, in some families, daughters may be worshipped as the Virgin Goddess (*Kumari*) until their puberty (Bennette, 1983). In the 1970s, Brahmin girls were married off at an early age of eleven or twelve whereas Chhetris a few years later (Bista, 1976). Traditionally, women are suppressed compared to men and more so after women get married (Bista, 1976; Bennette, 1983).

Bista (1976) defined Thakuris as the aristocrats among Chhetris with the highest social, political and ritual status. Thakuris are believed to have come from different backgrounds such as the Khas, Magar and possibly a few Rajput immigrants from India.

Traditionally, Brahmin and Chhetri women are mostly involved in agriculture-related work.

Brahmin and Chhetri marriages are supposed to be monogamous but polygamy is seen frequently. While landlords among these groups had five or six wives at a time, the rich Ranas among the Chhetris had several dozen wives and mistresses (Bista, 1976). Among the Chhetris, Thakuris also practise maternal cross-cousin marriage, a man marrying his mother's brother's daughter. The status and autonomy of Brahmin-Chhetri girl changes completely the day she gets married (Bista, 1976; Bennette, 1983). Her freedom is controlled by her elder in-laws and her husband. Traditionally, she needs to wash her husband's feet in the morning before she eats anything and must drink some of the (dirty) water or at least sprinkle it in her mouth (Bennette, 1983). A husband is considered to be the incarnation of God *Narayana* in their culture. Such customs may not apply to urban Thakuri and Rana women who have high autonomy and whose lifestyle is very modern and different to other Nepalese women. Smoking, drinking, playing cards as pastime, and hiring maids and servants for different chores are only a few examples of their luxurious life-style. As told by urban Thakuri and Rana women, premarital sex and extra-marital sex are not taboo in their culture.

Brahmins and Chhetris believe that a man and a woman do not marry merely by chance; it is a predetermined 'thing.' Thus they believe that the same relationship existed in their previous lives and will continue in the future as well. Such ideas may have discouraged divorce in Brahmin-Chhetri families (Bista, 1976). Brahmin and Chhetri women practise 'voluntary abstinence' by separating from their spouses for a month around June/July every year for religious purpose.

Although women have to work very hard to win the confidence of their husbands and other family members, they feel little comfort once they give birth to a child, especially if the child is a son (Bista, 1976). The Brahmins and Chhetris of western hills of Nepal take bride-price from the groom party. The bride-price is not a fixed amount, however (Bista, 1976).

There is an unfavourable custom in the Far Western Nepal in Dadeldhura and Baitadi districts among these groups. According to Bista (1976), Chhetris sell their daughters to rich Thakuris and Brahmins who dedicate the girls to certain deities in temples, to receive virtue in return. Such girls are not allowed to marry when they grow up as they are already married to the temple deity. They can cohabit with anyone they want to and may spend a life similar to that of a prostitute. Sons born to such women are called "Devko" and daughters "Devki", meaning "attendant of a deity." The Devkis need to remain single and continue to lead lives similar to their mothers.

Women in Untouchable Castes' Society

In Hindu caste system, Brahmins are positioned on the top level among the four hierarchical levels and the so-called 'untouchables' at the bottom (last) level. In the hills, the blacksmiths (*Kami*), the cobblers (*Sarki*), and the tailors and the traditional musical instrument players at marriage (*Damai*) are considered to be untouchables. The three hill untouchable groups are collectively called "Occupational caste" in modern days and is a large group, more than 1.6 million out of little less than 18.5 million population of Nepal in 1991 census (Central Bureau of Statistics, 2000). They are virtually landless people. There are untouchable castes among the Terai people and among the Newars of

Kathmandu Valley as well. The so-called high-caste people and others do not accept water and cooked food from the 'untouchable' castes. All the untouchables live usually in separate settlements far from the rest of the population.

The social status and the socio-economic status of the 'untouchables' are relatively very low. Things are, however, changing slowly and more and more children from these groups are sent to school. Lately, almost everywhere in the country, such groups emphasise the role of education in changing their status and express their joy in how the educated people among them are competing in every field with the high caste people (Kipp, 1995; Koirala, 1996)[3].

Within their own family, "Occupational caste" women's status is not low compared to that of men; thus in the household and the field, these women work side by side with their men. The untouchable women are treated well by their spouses. Husbands make sure that the wives who had just given birth get good food, even if they need to take a loan (Kipp, 1995). In most households both daughters and sons are loved and treated equally. These days, mothers in such castes are often anxious to provide higher education to daughters so that the daughters do not have to go through what they themselves had gone through (Kipp, 1995). The status and autonomy of women in untouchable groups are, however, changing significantly faster among the Newar people, most girls attaining higher studies.

Women in Muslim Society

Muslims reside in the Terai, the Western Nepal, and the Kathmandu Valley. The first batch of Muslims arrived in Kathmandu from Kashmir in the late 15th and early 16th century. In the 17th or 18th century, during the regime of the Chaubise Rajas of western hills of Nepal, Muslims were brought to Nepal from India to train local soldiers in the use of firearms. Later, after the Indian mutiny in 1857, Muslims started to migrate to different parts of Nepal as traders of bangles, glass beads, and leather goods (Bista, 1976). In the past, because the orthodox Hindus considered Muslims an unclean low caste, Muslim children attended a separate primary school opened by the Rana government. It was only in 1940 that Muslims were finally allowed to attend secondary schools and college (Bista, 1976).

Marriage is arranged mostly and is monogamous. But Muslim men are allowed to keep as many as four wives (Bista, 1976). According to Bista (1976), Muslims can marry anyone except for his or her own sibling. Muslim girls marry relatively earlier than girls from other ethnic and religious groups in Nepal (Bista, 1976; Thapa, 1989). Girls receive a dowry of clothes, house-ware, and jewellery from parents. The groom signs a contract agreeing to pay a certain amount of money to his wife in case a divorce takes place in the future. Remarriage of a widow or a second marriage does not hold any stigma in a Muslim society. Unlike in other countries where adultery is harshly punished by a lashing, adultery is punished only with a fine among the Nepalese Muslims (Bista, 1976).

The autonomy of Muslim women in the Terai was found to be less compared to their Hindu peers (Neidell et al., 1998). The same study also found lower education level and less movement for Muslim women compared to Hindu women. Wife beating was also found in the Terai Muslim society. Nepal's census 1991 reports Muslim women's literacy level as one of the lowest at 13%. The Terai Muslims are still competing among themselves to have large families. Muslim men from Terai stated that it is prestigious in their culture to have as big a family as possible with at least one son (The Kathmandu Post, 1999). The Terai Muslim society also feel discrimination against them by the broader society, thus Muslims addressing themselves as 'us' and Hindus as 'them' is common in Terai areas. On the other hand, Muslim women of Kathmandu are modern, educated, and involved in different occupations including traditional bangle and bead selling. They also speak local Newar language and many have married Newar men. Muslim women of Kathmandu seem to be assimilating into the broader society at a fast pace. Their autonomy is definitely higher than their sisters in the Terai and hill areas.

Women in Terai Societies

The southern strip of Nepal bordering India, spreading from the east to the west of the country is known as the Terai. This flat lowland has a tropical climate, fertile land and huge jungles, and was highly malarial until some four decades ago. The Terai people are mostly of Indian origin, migrated from India some 200 years age. However, Tharus, the largest group among all the ethnic groups of the Terai (about 1.2 million in 1991 census of Nepal) claim that they fled India some 700 years ago at the time of the Muslim invasion (Bista, 1976).

The Terai women cannot be generalised as one group. Similar to the hill Hindu groups, Terai ethnic groups comprise of the highest Brahmin groups to Kshatriya Rajputs to untouchable castes[4]. They speak many different languages of Indian origin including Urdu, depending on which part of the Terai they live in. The majority of the Terai dwellers are Hindus, Muslims being minority. In general, the Terai women are hard workers. In the Terai communities, the status of women is considered lower as their caste level descends. It is the highest caste Brahmins and Kshatriyas, and even the hill migrants Brahmins, Chhetris and Newars, who are *Zamindars*, the landlords, and the rest being tenant farmers. Poor women live a very difficult life working from dawn till night. They even massage their landlord's wife at night free of charge. In the Terai villages, people still find "master-servant/maid" relationship in everyday life.

The situation is different for some specific ethnic women in the Terai. The women from Janakpur, the former capital of Mithila, are skilled in colourful traditional painting that they draw and paint on the walls of their houses. The Maithili women's drawing/painting has become world famous in modern days through women's development projects and the endeavour of foreign as well as Nepalese entrepreneurs.

Marriages are arranged and are both endogamous and monogamous in most Terai cultures. Age at marriage is low compared to most hill and mountain ethnic groups. There is a custom in Terai, especially in the Eastern Terai, among the Hindu groups, where parents have to give *tilak* compulsorily. *Tilak* is a traditional gift provided to the groom from the bride party. *Tilak* for the groom contain money, watch, jewellery, radio, scooter, including any kind of modern household appliances and even car if the bride's parents can afford. In some cases, the groom party may demand a specific amount of money or material goods. In fact, in most cases, the more a groom is educated or is well-paid (in a job), the higher the *tilak* amount demanded. The parents of the groom want to be compensated through the *tilak*, the amount of money they spent on him. Most parents in such societies start to worry about how to accumulate money for the *tilak* the day a daughter is born. They begin to save money by curtailing their daily needs. These traditions have such a high value in their societies that they even take loans with their landlords to fulfil the *tilak* demand[5]. Harassing a new bride and continuing to do so until later, are common if her parents cannot fulfil the groom party's demand. Unlike in India, bride burning is not common in Nepal's Terai. However, one or two such cases were in the news some years ago. Wife beating may be common in such societies. Such cultures may be the main reason why sons are preferred to daughters in the Terai area more than anywhere else in the country.

In many Terai ethnic groups, especially in the high castes and more strictly, among the Rajputs, women cover their faces with their *saree* or shawl in front of elder male in-laws and strangers. In contrast, Tharu women move around freely and also go to other villages in groups to participate in *Hatiya*, or *Hat Bazaar*, a weekly market. Tharu women like to cover only a part of their upper body with clothes. Tharus believe that during the Muslim invasion in India, Tharu women migrated to Nepal with their servants who later became their spouses (Bista, 1976). As told by the Terai residents, to this day, among the Rana Tharus when wives distribute food, they touch the food plate of their husbands with their foot first, to show that the husbands' status is lower than theirs. The Tharu and Mahato women of Terai are found to have more autonomy and higher age at marriage compared to the Terai Muslim women (Neidell et al., 1998). However, Tharus are the most exploited group among the other Terai groups, by the *Zamindars*. Many Tharu women still work as maids for such families. The 1991 Census of Nepal shows only 12% Tharu women as literate.

Women in Newar Societies

The Newars are the indigenous inhabitants of the Kathmandu Valley. Although, the Newars are considered to be a "caste" or an "ethnic group" in the census, they are, in fact, a collection of castes[6]. The rituals, culture and customs, lifestyle, ceremonies, and in some cases even festivals differ among each Newar caste. Thus, Newars have complex societies within their castes.

Scholars have different speculation about the origination of the Newars. Lévi (1905) postulated that the Newars immigrated to Nepal from regions north of the Himalayas. Fürer-Haimendorf (1956) believed that the Newars belonged to Nepal since the prehistoric times. Whether the Newars are of Mongoloid (popularly called "Tibeto-Burman" in Nepal) background or Caucasoid (called "Indo-Aryan" in Nepal) has also been a matter of debate in Nepal. Okada (1957) found evidences of Newars belonging to Mongoloid group.

The Newars are famous for their arts, crafts, and trading skill. Newar women are famous for their hard work, liveliness, sense of humour, and cooking skills. They are well-known also for their traditional yet sophisticated style and fashion, and varieties of jewellery they wear. Newar women, also religious in nature, in general, are considered to be the backbone of a family. A Newar family is usually an extended one. Women as household heads, as mothers, and as mothers-in-law, are highly regarded. In most cases, mothers or mothers-in-law handle the household expenditure and family treasure. However, women may have different roles and status in the families of Hindu and Buddhist Newars. In Hindu families, women may be orthodox, reserved and less outgoing. Their status may be similar to that of Buddhist women, but they may have less freedom in society. However, in the past, more high-caste Hindu girls started attending school compared to high-caste Buddhists because high-caste Hindu Newar men were more involved in the country's administrative work, therefore valued education more than Buddhist priestly-caste fathers who worked in traditional occupations. Nevertheless, in the past (to this day in some orthodox families), unlike their educated Buddhist peers, high-caste Hindu girls were not given freedom to work outside even though they were educated. In the low caste societies, men and women may share all kinds of work including household chores and their family business. In such societies, women are also allowed to express themselves freely while talking to the opposite sex. As in some other castes of Nepal, girls in general, also feel like subordinates to men, be it a father, a brother or a husband in spite of their so-called freedom in family and society. As for occupation, Newar women, in general, have been involved in traditional occupations and family businesses from ancient times.

Newar men and women have to go through a number of rituals and celebrations since their birth. Apart from these, Newar girls need to go through two fascinating rituals before puberty, one called *ehi* at a younger age and the other called *barha* at the time of coming of age[7]. Because of these two rituals in which girls celebrate 'mock marriage' with God Narayana (to some it is God Kumar) during *ehi* and with God Surya (Sun God) during *barha*, widowhood has less stigma in Newar societies. However, the so-called unclean castes and untouchable castes do not have such rituals. Some of the Newar girls also have a chance to become a Kumari, the Virgin Goddess popularly known as the Living Goddess[8].

Marriage is patrilocal and monogamous among the Newars. Lineage and caste backgrounds are given a great importance in Newar societies. Marriage in the same lineage is allowed after the seventh generation. Polyandry is not practised, polygamy is not usual, and cohabitation is socially unacceptable in Newar societies. Bigamy (which is unrestricted in the Nepalese constitution under some conditions), however, is allowed in Newar societies when the previous wife cannot bear a son. Almost in all Newar castes, a daughter also plays an important role during the death rituals whether it is at the time of the death, or during monthly or yearly rituals. In Newar societies, infants are looked after with extra care and older children are brought up with affection and priority, especially if the child is the first one or the youngest, regardless of sexual orientation.

Child marriage was practised until three generations ago. Families try to avoid inter-caste marriages both within Newar castes or non-Newar castes as far as possible even today. The degree of acceptance of inter-caste marriages may be higher among the low castes compared to the orthodox high castes such as the *Sesyo*, *Bare*, and *Gubhaju*.

Traditionally, marriage is arranged by parents through a 'middle' woman or man called *lami* who is known to both parties[9]. Newar marriage ceremony is rather a long process consisting of several events, many of them connected to gift exchange, feasts, and other fascinating customs and rituals, which occur before and after the wedding. The process takes months to complete with both parties contributing a lot of time and money[10]. A dowry is a must among the Newars and is lavish in most cases. A woman has sole control over her dowry (*kwasa:*) and all wedding gifts including money. Another kind of marriage for Newars is elopement, which is considered to be disgraceful among the so-called high-caste Newars, but is common among the farmers and other low-caste groups (Nepali, 1965; Bista, 1976, Gellner, 1991). Newars have a very nurturing traditional prenatal and postnatal care for both the baby and the mother. Newar women, in general, have a special bond with her natal home where she and her children are always welcome.

Divorce, separation, remarriage and widow marriages are all considered disgraceful not only by high caste Hindus but also by all that belong to other Newar castes. But the degree of tolerance and acceptance varies among the different castes and localities. However, compared to other orthodox castes of Nepal, divorce is not subject to much criticism in a Newar society. A separation is more common than a divorce among the Newars. Marriage is not considered as a particularly sacred or unbreakable relationship by many Newars, especially Buddhist Newars (Bista, 1976). Among the "*Uraye*" Newars (Buddhists by birth), if the husband of a young woman dies, she can put the "marriage betel nuts" on her dead husband's body and become free as an unmarried woman[11]. After the divorce or death of a husband, remarriage is not a taboo for a young Newar woman. However, a considerable variation within the Newars exists in the degree of freedom women have to divorce and remarry according to the caste and/or religion, and the locality they belong to (Gellner, 1991). On many occasions women (widow or otherwise) elope with their lovers along with their children. A number of Newar girls are also found to live as mistresses or second wives in Newar societies. A substantial number of never married single women could be seen in Newar communities.

Ethnic Fertility: Analysis

The above background demonstrates that the different ethnic groups in Nepal have varied lifestyles based on the traditional socio-cultural practices. Women's status and autonomy seem to be moulded according to such practices. For example, many Terai ethnic women, in general, have low status and autonomy. But among these groups, because of the class hierarchy and varied social norms, the so-called high castes such as the Terai Brahmins have high status, while the women from the indigenous Tharu background have high autonomy. Among the hill dwellers, most women belonging to the Mongoloid groups such as the Gurungs, the Sherpas, the Rais, the Limbus, the Tamangs, and the Magars are highly autonomous. Among the other hill dwellers, the Brahmin and Chhetri women have high status in society by virtue of being from high castes but have low status and autonomy within the family. The Newar women, originally from the Kathmandu Valley, are complex cultural groups and their status and autonomy are mixed between the high and the low. Muslim women, on the other hand, have both low status and autonomy.

Women's status and autonomy play a significant role in interacting with people, media, visiting places, seeking medical help, going to school, attending adult literacy classes and awareness classes, and involving in income generating activities. All of these affect their health, fertility behaviour, mortality, overall development and, consequently, their life expectancy, which influence the demographic transition of the country directly and indirectly. Most importantly, the above information on different lifestyles and customs of diverse ethnic groups unveil, among other things, their fertility preference, marriage pattern, preferred age at marriage, and preference for sex of children.

Women's socio-cultural practice and their fertility preference are highlighted for various ethnic groups in Table 5.1. The mean age at marriage is the highest at 19.1 years for the Rai and the Limbu women, the second highest being that for Newar women at 18 years. Other Mongoloid women such as the Gurungs, the Magars, and the Tamangs also have relatively high age at marriage. Muslim women and Terai women, in general, seem to marry early (mean age of 15 years). Age at first birth does not correspond to age at first marriage for each group, however. Mean age at first birth is also the highest for Rai and Limbu women at 21.5 years, second highest being that for the Newars at 20.2 years. The lowest mean age at first birth (18 years) corresponds to 'Other Terai origin' women. Generally speaking, Mongoloid women and Newar women have about two years interval between the two events (marriage and first birth), all others have about 3 years gap except for Brahmin women who have 4 years interval. In most Terai cultures, girls return to their natal home after marriage and start having relationship with their spouses only after the *gauna* ceremony that takes place a year or more later. Naturally, the period between marriage and the first birth would be longer for them. Mongoloid women practise a similar custom but the married man and woman may see each other whenever they want to, during this period. Normally, spouses know each other before marriage in Mongoloid societies. These may be the reasons why the period between the two events is only 2 years for them. It seems like Brahmin girls take longer time to establish an intimate relationship with their spouses.

Figure 5.1 demonstrates that fertility is still high across all ethnic groups, with Muslims and Tamangs having higher fertility than the other groups, while the Newars, the Brahimins, the Gurungs, the Yadavs and Ahirs, and "other Terai" groups having lower fertility. The figures from "mean number of living children" reveal that the Tamangs lost most of their children (Table 5.1). This may be the reason that encouraged them to have more babies despite the literature that indicates Tamang people's desire for less number of children. The same Table (5.1) also shows that Muslim women prefer an overwhelmingly large number of sons (15.1) and daughters (14.4), which is in line with the literature. In addition, Muslim women are the least users of contraception (Table 5.3) and most Muslim husbands do not approve of family planning (Table 5.4). Hence, it is not surprising to find a relatively higher "number of children ever born" for Muslim women than others.

On the other hand, Newar women have lower fertility than most other groups, perhaps, because they are relatively more educated, relatively higher percentage of them live in urban areas than other groups (Appendix 5.5), and women have relatively high status and autonomy in the family and the community. Brahmin women are relatively more educated (Appendix 5.5) and are also known to migrate to urban areas more often. Moreover, Brahmin men are politically a powerful group, which may be advantageous to their women in personal well-being and high status in society, consequently, encouraging women to have small family. Also, highly autonomous Gurung women are competing with other ethnic women in the area of education, trade, and so on. Besides, more than other Mongoloid groups, Gurungs like to migrate to urban areas for various opportunities. Furthermore, their usual dwelling in Western Nepal includes such famous tourist centre as Pokhara where women have opportunities to get involved in varieties of work and in interaction with outsiders, including foreigners. All of these factors may have depressed the Gurung women's fertility. The Terai dwellers Yadav and Ahir women's relatively low fertility may be connected to their *tilak* tradition. Although giving birth to sons means gaining *tilak* when the sons marry, couples may not want to take chances of bearing daughters, in which case *tilak* is needed to be given. This may be one reason of their relatively lower fertility compared to others.

Newar women and Chhetri women prefer the least number of children at 2.9 and 3.0 respectively (1.6 boys and 1.3 girls for Newar women, and 1.8 boys and 1.3 girls for Chhetri women) (Table 5.1). Sex differential for the preference is also the least for Newar women. Surprisingly, Mongoloid women, in general, want relatively high number of children. On the other hand, even though socially disadvantaged, the Tharu women and women from 'occupational castes' prefer relatively low number of sons (2.6 and 2.9 respectively for Tharus and 'Occupational caste') and daughters (1.9 and 2.2 respectively).

In general, most girls 15-19 years are married (Table 5.2). For more generalisation, if we divide the groups as "Terai origin" and "hill origin," the latter groups, except for the "Occupational caste" prefer to marry later than the former groups. When the groups are separated by the language origins, the figures show even clearer picture. What the numbers demonstrate is the fact that the "Tibeto-Burman" language speakers (except for the Magars) prefer to marry much later compared to the "Indo-Aryan" language speakers. Moderate percentages of "Tibeto-Burman" speakers also married at a later age (25-29 years).

In general, almost all women in different ethnic groups have knowledge about family planning and contraceptives (Table 5.3). The figures from Table 5.3 correspond to those in Table 5.1 in that those who often use contraceptives, desire fewer children.

This observation does not seem to apply to the 'Occupational caste' women, however. Although they do not desire many children, they use limited contraceptives. Newars are the ones who have used contraceptives the most in the past and currently, Muslims being the least users. Spacing is also the most popular method for the Newars among all the groups. It is interesting to note that none of the male Muslims have been sterilised. In fact, male sterilisation is the least preferred method of contraception for all the Terai ethnic groups including the Yadavs and Ahirs, and the Tharus. Majority of both men and women in most ethnic groups are sterilised after they have 2-3 children or over 5 children; a substantial percentages of these groups are sterilised after having 4 children; marginal percentages of mostly hill dwellers are sterilised after just one child. The figures that stand out the most from Table 5.3 are those of the Rais and the Limbus (about 60%) sterilisation after 2-3 children and a large percentage of Muslims' (more than 82%) had sterilisation only after they had 5 or more children. The figures from this Table (5.3) signify each group's lifestyle and social characteristics as discussed in the literature.

Large percentages of husbands from most ethnic groups approve of family planning (FP) (Table 5.4). Approval is very high for the Brahmin (84.5%) and the Newar (83.9%) groups and the lowest for the Muslims (40.7%). In fact, half of the Muslim husbands and about one fifth of the Yadavs, Ahirs, and 'Other Terai origin' did not approve FP. A little less than half of all the women discussed family planning with their husbands in the past year. In most cases, both the spouses wanted the same number of children. However, a substantive number of spouses also desired more children than wives.

Figure 5.1

Mean Number of Children Ever Born by Ethnicity, Nepal, 1996

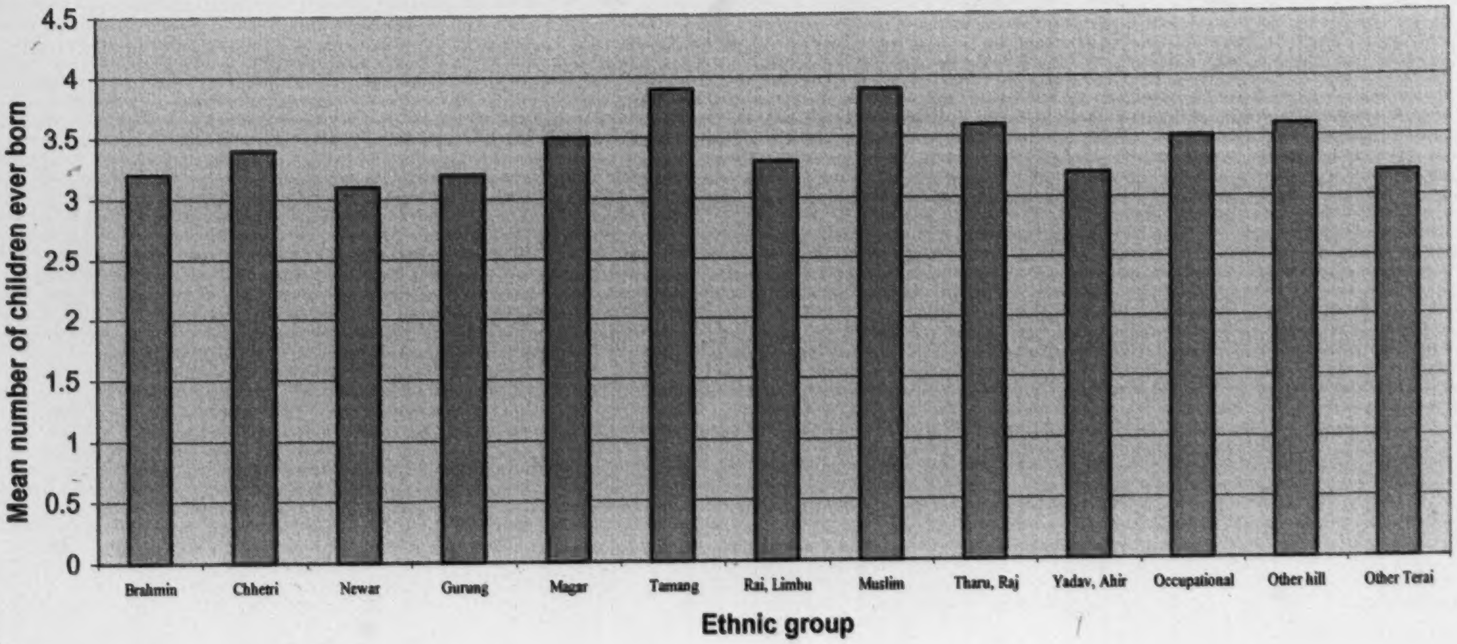

Table 5.1: Fertility Characteristics of Nepalese Women in Different Ethnic Groups, Nepal, 1996.

Ethnicity	Population (in the survey)	Mean age at first marriage (years)	Mean age at first birth (years)	Mean no. of children ever born	Mean no. of living children	Ideal no. of children preferred	Ideal no. of boys preferred	Ideal no. of girls preferred
Brahmin	1146	15.8	19.3	3.2	2.8	3.5	2.4	1.9
		(3.1)	(2.8)	(2.3)	(1.9)	(9.5)	(9.6)	(9.6)
Chhetri	1466	16.1	19.3	3.4	2.8	3.0	1.8	1.3
		(2.9)	(3.1)	(2.5)	(1.9)	(4.5)	(4.5)	(4.5)
Newar	509	18.0	20.2	3.1	2.7	2.9	1.6	1.3
		(3.2)	(3.3)	(2.2)	(1.8)	(5.7)	(5.8)	(5.8)
Gurung	107	17.3	19.5	3.2	2.7	6.5	5.5	5.1
		(3.5)	(3.7)	(2.5)	(1.9)	(19.2)	(19.4)	(19.5)
Magar	596	16.9	19.8	3.5	2.9	4.7	3.5	3.1
		(3.1)	(3.4)	(2.5)	(2.0)	(13.7)	(13.9)	(14.0)
Tamang	472	17.1	19.9	3.9	3.0	6.8	5.4	5.0
		(3.2)	(3.4)	(2.6)	(2.2)	(18.1)	(18.4)	(18.5)
Rai, Limbu	370	19.1	21.5	3.3	2.7	5.0	3.7	3.2
		(4.2)	(3.7)	(2.4)	(1.9)	(13.5)	(13.7)	(13.8)
Muslim, Churaute	421	15.0	18.1	3.9	3.1	16.4	15.1	14.4
		(2.0)	(3.0)	(2.8)	(2.3)	(31.9)	(32.5)	(32.7)
Tharu, Rajbansi	670	15.8	18.6	3.6	3.0	3.8	2.6	1.9
		(2.4)	(2.9)	(2.5)	(2.0)	(8.4)	(8.5)	(8.6)
Yadav, Ahir	319	15.1	18.6	3.2	2.5	7.2	6.0	5.2
		(2.2)	(3.2)	(2.3)	(1.7)	(18.8)	(19.1)	(19.3)
Occupational castes	1234	15.2	18.5	3.5	2.7	4.1	2.9	2.2
		(2.4)	(3.0)	(2.7)	(2.0)	(9.8)	(9.9)	(9.9)
Other hill origin	252	15.5	18.7	3.6	2.8	7.4	6.0	5.5
		(3.1)	(3.4)	(2.7)	(2.0)	(19.1)	(19.4)	(19.5)
Other Terai origin	867	14.9	18.0	3.2	2.6	7.8	6.7	5.8
		(2.0)	(2.8)	(2.3)	(1.8)	(20.4)	(20.7)	(20.9)
Total	8429	16.0	19.1	3.4	2.8	5.2	4.0	3.4
		(3.0)	(3.2)	(2.5)	(2.0)	(14.4)	(14.6)	(14.7

Source: Computed from the Nepal Family Health Survey, 1996 data. Note: Standard deviations under parentheses.

Table 5.2: Age at First Marriage by Ethnicity, Nepal, 1996.

Ethnicity	Age at marriage						
	15-19 (%)	20-24 (%)	25-29 (%)	30-34 (%)	35-39 (%)	40-44 (%)	45-49 (%)
Brahmin** (1)	83.1	15.5	1.3	-	-	-	-
Chhetri** (1)	85.4	13.0	1.5	0.1	-	-	-
Newar** (2)	68.8	26.5	4.5	0.2	-	-	-
Gurung** (2)	70.2	25.0	4.8	-	-	-	-
Magar** (2)	81.7	15.8	2.1	-	0.4	-	-
Tamang** (2)	74.0	23.1	2.7	0.3	-	-	-
Rai, Limbu** (2)	53.6	35.5	9.0	1.2	0.3	0.3	-
Muslim, Churaute* (1)	96.2	3.8	-	-	-	-	-
Tharu, Rajbansi* (1)	90.0	9.6	0.4	-	-	-	-
Yadav, Ahir* (1)	94.0	4.5	1.5	-	-	-	-
Occupational castes** (1)	93.4	6.0	0.4	0.3	-	-	-
Other hill origin** (1 or 2)	83.6	13.2	3.1	-	-	-	-
Other Terai origin* (1)	95.4	4.4	0.2	-	-	-	-
Total	83.8	14.1	1.9	0.2	0.1	-	-

Source: Computed from the Nepal Family Health Survey 1996 data.

Note: * Terai origin (1) Indo-Aryan language speakers
** Hill origin (2) Tibeto-Burman language speakers
"-" indicates "none"

Table 5.3: Knowledge and Use of Family Planning, and Parity at Sterilisation, Nepal, 1996.

Ethnicity	Know ledge of FP (%)	Never used contracep tives (%)	Current status of family planning use				Percentage sterilised after having			
			Not using (%)	Spacing (%)	Female sterilisa tion (%)	Male sterilisa tion (%)	0-1 child	2-3 children	4 children	5+ children
Brahmin	99.6	50.5	62.7	13.0	14.1	10.2	1.4	43.5	20.5	34.5
Chheti	99.4	60.8	70.9	11.5	10.2	7.5	2.3	41.7	22.8	33.2
Newar	99.8	31.6	51.2	30.5	11.4	6.9	1.1	41.5	29.8	27.7
Gurung	93.5	62.6	76.4	8.5	9.4	5.7	-	47.1	11.8	41.2
Magar	98.2	63.2	76.7	9.1	6.2	8.1	2.4	35.3	24.7	37.6
Tamang	92.6	65.3	76.0	13.0	3.4	7.6	5.8	36.5	30.8	26.9
Rai, Limbu	97.8	66.0	79.5	13.2	4.1	3.2	3.7	59.3	7.4	29.6
Muslim	97.6	82.7	88.8	7.1	4.0	-	-	17.6	-	82.4
Tharu, Rajbansi	99.4	55.1	67.5	9.7	20.7	2.1	0.7	30.7	21.6	47.1
Yadav, Ahir	99.4	69.0	71.8	5.0	22.9	0.3	-	32.0	25.3	42.7
Occupational castes	98.3	72.3	81.2	5.3	10.0	3.5	-	32.3	16.2	51.5
Other Hill Origin	91.7	77.8	86.1	5.6	6.7	1.6	9.2	27.3	27.3	36.4
Other Terai Origin	99.1	71.8	77.5	5.0	16.9	0.6	-	29.1	26.5	44.4
Total	98.3	62.6	73.0	10.4	11.4	5.1	1.4	37.2	22.2	39.2

Source: Computed from the Nepal Family Health Survey, 1996 data.
Note: "-" indicates "none".

Table 5.4: Attitudes of Husband and Wife about Family Planning, Nepal, 1996.

Ethnicity	Husband disapproves FP	Husband approves FP	Discussed FP with husband			Husband's desire for children		
			Never	Once or twice	More often	Both want the same number	Husband wants more	Husband wants fewer
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Brahmin	7.1	84.5	52.4	37.0	10.6	70.9	13.5	8.9
Chhetri	8.1	79.7	51.1	39.3	9.6	65.2	16.0	8.6
Newar	8.1	83.9	45.8	37.9	16.4	71.0	15.6	6.8
Gurung	8.9	71.3	53.5	35.6	10.9	62.4	13.9	5.9
Magar	9.4	78.1	57.1	36.9	6.0	63.1	19.4	6.4
Tamang	9.4	68.5	61.8	29.7	8.5	58.9	18.9	4.3
Rai, Limbu	10.0	67.1	59.3	33.6	7.1	57.4	20.6	5.3
Muslim, Churaute	49.9	40.7	75.3	19.0	5.7	59.4	19.7	5.2
Tharu, Rajbansi	10.8	77.5	51.4	30.6	18.1	61.9	15.7	12.3
Yadav, Ahir	22.0	67.3	60.8	32.7	6.5	67.6	19.1	7.1
Occupational castes	14.6	69.1	61.6	31.2	7.2	62.9	16.7	6.8
Other hill origin	14.6	59.0	63.9	32.4	3.8	51.3	22.7	2.9
Other Terai origin	20.3	68.6	63.6	28.2	8.2	62.9	16.9	7.9
Total	13.5	73.3	57.2	33.4	9.4	64.0	16.9	7.5

Source: Computed from the Nepal Family Health Survey, 1996 data.

Discussion

The relationship between cultural aspect of modernization and fertility is studied in this section. A number of valuable findings emerged. All the ethnic groups included in the survey have different characteristics, socio-cultural practices, and fertility behaviours. Generalisation of groups in such situation may seem impossible. However, some indication of similarities in trend and group behaviours was noted. In the process of generalisation, it became clear that women from high autonomy background, particularly those who speak Tibeto-Burman languages, tend to have high age at first marriage and high age at first birth. Overall Chhetri, Muslim, and the Terai women's age at marriage increased marginally in the 1996 Nepal Family Health Survey compared to the 1976 Nepal Fertility Survey. It is encouraging to note that relatively rapid increase is noticed for the Newar, the Rai and the Limbus, and the Brahmin women from 16.4, 17.3, and 13.5 years of mean age at marriage respectively in 1976 (Thapa, 1989) to 18, 19.1, and 15.8 years in 1996 (Table 5.1).

Another important message is that merely having knowledge about family planning and contraceptives is not a sufficient reason for actually using such devices. Generally speaking, "ever used contraceptives" and "currently using" percentages were very low for almost all the ethnic groups except for the Newars. Apart from being in open and autonomous cultures, the relatively high percentage of Newar women currently using contraceptives may also be a result of the highest percentage (32.4%) of the Newars in the survey being the residents of urban areas (Appendix 5.5). In general, 27 percent of the total Nepalese women "currently using" contraceptives (including sterilisation) and more than 98 percent awareness (Table 5.3) are encouraging compared to 2.9 percent "currently using" and 21 percent awareness in 1976 (Health Ministry, Nepal, 1977). Success of contraceptive use depends not only on the access to the device, affordability, assurance of non-adverse impact of the device on health, and clear explanation of pros and cons of the device by health personnel but also on many factors such as the understanding between a couple, cultural norm for a large family, willingness to use, and approval by other family members, all of which are influenced by the socio-cultural norms and practices of each ethnic group. There is a clear indication that the male dominating societies such as those of the Terai background, including the Muslim society, are the least users of the device, especially in terms of male sterilisation. Most women in such societies also wait for 5 or more children before they accept sterilisation. Muslims stand out the most in this regard. Nevertheless, on the whole, it is encouraging that among all Nepalese who were sterilised, a large number (37.2%) decided to have sterilisation after they had 2-3 children rather than waiting for more (Table 5.3).

Compared to "wanting fewer children," a higher number of husbands' desire "for more children," may also be an indication of male dominating societies, in general (Table 5.4). Similarly, more than half of the women, generally speaking, did not discuss family planning with their spouses. This may also support patriarchal societies and cultural modesty shown by women[12]. Marriages in most of the groups were intact. Instability in marriage is seen among the Mongoloid groups, in general (Appendix 5.2). At the same time, remarriages or multiple marriages are also relatively high among the same groups. Both, stability of marriage (prevailing in most of the groups) and remarriage (practised mostly by the Mongoloid groups) tend to result in high fertility.

Women in socially deprived groups such as the Tharus and the "Occupational caste" preferred less number of children as shown by the "ideal number of children" (Table 5.1). As discussed in the text, these women are aware of the value of education and living standard, which would eventually lead them to compete socially and economically with the high caste groups. Thus, desiring a few "quality" children has, probably, become a norm. This could be taken as a first stepping-stone in terms of possible fertility decline for socially and economically underprivileged ethnic groups such as these.

Overall, Muslim women scored very low socially and demographically. They were the least literate; many of them were not working; and, only a few were using contraceptives; most Muslim husbands did not approve of family planning; most sterilisation were done only after having 5 or more children; none of the Muslim husbands were sterilised; a large number of Muslim households (about 24%) have 3-5 children under 5 years; and autonomy of women was very low including spending their own money[13]. Women's educational mobility to higher level will likely be one of the strongest weapon to overcome their poor status. Nevertheless, until Muslim men's attitude towards family size, women's freedom and status changes, it may take longer for Muslim women's fertility to decline as opposed to other cultural groups.

When it comes to the overall wellbeing of women and children, and improvements in their living-standard, it is not only literacy and work that affect their wellbeing but also autonomy of women and the freedom they have in spending their money. Women tend to spend money on food, on children's need, and medications. They also like to spend on village festivals and movies, both of which may have good impact on their wellbeing because of interaction with different people, new information on health-related topics including family planning through commercials, documentaries and so on. Unlike men (especially men residing in the hills) who like to spend money on gambling and liquor, women also like to save for a rainy day. In this regard, most Mongoloid women have freedom to spend their money for good cause because they control over their earnings whereas women from the Terai background do not.

As discussed above, the findings clearly show that women's characteristics, fertility behaviours, autonomy and social status differ significantly among the various ethnic groups in Nepal. These factors are influenced mostly by their socio-cultural practices, and consequently, by their lifestyles. This research demonstrates how the socio-cultural background of a nation is indirectly affecting its demographic transition, mostly mediated through fertility preferences. Despite such facts, social scientists and policy planners of the country do not seem to pay much attention on the socio-cultural component for a desired demographic and epidemiological outcome.

Although, Tibeto-Burman language speakers practise cultures that depress fertility, because these groups represent only a little more than a quarter of the total population of Nepal in 1991 census (Central Bureau of Statistics, 2000), their contribution in Nepal's overall fertility seems to be marginal (Thapa, 1997). Because of the large population proportion of the Indo-Aryan language speakers, it may not be an exaggeration to say that Nepal's fertility may not decline drastically unless these groups, including the Muslims, follow the paths taken by the Tibeto-Burman groups. Learning from each other's cultures and even changing attitudes towards women such as giving freedom to them and respecting and treating them well, and considering women more than merely as “child bearers” in the family, may affect these women's fertility behaviours.

An intensive study of various cultures and lifestyles may reveal a great number of obstacles faced by different cultural groups in Nepal. These obstacles prevent them from being upwardly mobile in terms of social status. And because of low social status, people from specific ethnic background are deprived of economic, political, and other development-related opportunities. Also, as unveiled by this study, the preference for a large family and the need for a son depend, among other things, on cultural beliefs and social norms rather than on economic value of children. Patriarchy, clearly, predominates in most Terai societies. In some cases, the social values and cultural norms are so strong that people tend to spend all the money, time, and energy they have on events related to such values and norms rather than on personal wellbeing. Also, women from a highly patriarchal society such as the Muslim, want and produce a large number of children.

However, despite being in traditional and family oriented societies, it is encouraging to note that women in most ethnic groups have a changed attitude towards fertility preference[14]. The mean number of children ever born is lower than the mean number of children preferred for almost all the groups, which is also promising in terms of a likely fertility decline. In fact, the basis of initial family planning programmes in many developing countries, which assumes that the actual number of children ever born exceeds the number desired by parents (Okojie, 1992) hold true in Nepal's case for 1976 Nepal Fertility Survey (the "mean number of children ever born" was 5.6 and the "mean desired children" was 4 in 1976). In this respect, the change in attitude and fertility behaviour found in the current study is quite remarkable. Even in the 1980s, a drastic change in family planning attitude was found among the Brahmin, Chhetri, and the “Occupational caste” women who were new migrants from the hills to the Kathmandu City. Schuler and Goldstein (1986) argued such change as a necessity for a city lifestyle with high cost of living and inflation. It is also noteworthy that, although, the mean age at first marriage is low for most cultural groups, the mean age at first birth is relatively high. In other words, the first birth interval is relatively long, which is good for a population with high fertility (currently, total fertility at 4.1) (Ministry of Health, 2002) such as Nepal's. As discussed in the text, long "first birth interval" is associated to the cultural practices of different groups. In addition, the delay may also be associated to the sub-fecundity common to very young girls as was found by Caldwell and colleagues (1982) in Bangladesh.

Furthermore, almost all women had family planning knowledge, which may eventually lead to lower fertility. A substantial percentage of sterilisation after having only 2-3 children indicates women's changed fertility behaviour. Moreover, son preference in Nepal is not motivated by economic reason but rather by reasons such as "for old age security" (to care during sickness and old age)[15] and "for continuity of the lineage of the family" (Schuler and Goldstein, 1986; Karki, 1988; Niraula and Morgan, 1995). Similar to the discussion in the literature, these studies also found girls wanted by parents as a “joy”, as a Laxmi (the Goddess of wealth) and as a caregiver in their old age, and girls playing important roles in religious ceremonies. The fact that parents consider children as an economic burden may be the strongest reason for Nepal's recent fertility decline.

The findings indicate that Muslim women will take the longest time for fertility transition followed by the Terai women, in general, then the Brahmin and Chhetri women, the "Occupational caste" women, and the Mongoloid women, Newar women taking the least time. In the future, a multivariate analysis of the fertility data for different ethnic groups will be useful to better ascertain the independent role of ethnicity and culture. Also, low fertility among the urban and highly educated women has been reported in Nepal (Central Bureau of Statistics, 1995). Hence, encouraging cultures that depress fertility, giving autonomy to women in all fields including education, may bring down fertility of Nepalese women to a desired low level.

Although many complexities are explored from this study, a number of questions remain unresolved. Why do the Muslims of the Terai want as many children as they can have even in poor conditions? Is it because they want their identity to be known and want to be politically (or numerically) strong within the broader society? Why are the socio-economic conditions including literacy of Mongoloid women so low in the national context despite these women's high status and autonomy in the family and the community? Why are the status and autonomy of the Terai origin women, in general, so low? What could be done to uplift the social status of the "Occupational caste" women? These are some of the important questions that the future researchers and the concerned government of Nepal need to explore to bring down fertility to a desired level. Formulating appropriate policies for various cultural groups come next. In addition, this research may be further developed by conducting an in-depth study of different castes among the Newars to explore more about the causal relationships between socio-cultural (and socio-economic) factors and fertility preference among the different castes of the Newars.

The hierarchical classes of different ethnic groups existing in Nepal, among other things, also seem to be affecting its slow demographic and epidemiological transitions in a significant way. In almost every field, be it political, economic, educational (especially, in higher education) or status-related, it has always been the so-called high-caste people who have been enjoying the available facilities for centuries. In such situations, it is not easy for the economically deprived and socially underprivileged groups to compete with the so-called high-caste groups, in socio-demographic field. Thus, in the national context, the major problems are not common for all ethnic groups. In the demographic areas, the challenges faced by these groups are varied and serious in nature. The population and health policies of the country and the mode of implication must be shaped according to the demand of and need for different cultural groups. Imposing one common rule and suppressing a large number of minorities' needs may not produce positive outcome in a culturally diverse country such as Nepal. Social deprivation and hierarchical classes may be some of the reasons why it has taken so long for the country in its path to demographic transition. It is likely that until and unless uplifting the conditions of women and socially deprived groups is a priority, the demographic and epidemiological transitions will remain distant for the country.

Endnotes

1. Similar to the experience of the Gurungs, there are reports related to other mountain ethnic groups such as the Thakalis who changed their religion and also cultural practice to some extent so as to fit into the 'Hinduisation' process of the broader society. Nevertheless, the Thakalis has been practising Tibetan (*Lamaistic*) Buddhism for centuries and their customs and rituals are purely Buddhist in nature (Fürer-Haimendorf, 1966).

2. Pasang Lhamu, a Sherpa woman, was the first Nepalese woman to reach the top of the Mt. Everest in the early 1990s.

3. There are reports that many girls from the 'Occupational caste' questioning Brahmin researchers and foreign researchers about why they are treated the way they are (Kipp, 1995; Koirala, 1996). Many were wondering if the reason for such treatment was because they consumed pork and beef. They questioned if that was the case then why many Mongoloid groups who also consume pork and beef are not treated like untouchables. As observed in some communities and also as reported by Holmberg (1989), blacksmith women (the Kamis) in the hills are accused of being witches also.

4. *Kshatriya* in the Terai is similar to Chhetri in the hills.

5. Children of poor families in the Terai thus work for their landlords to repay the debts, which may go on for generations because of the high and random interest rates. This is how the poor remain poor in Terai always. One of the major causes why girls (even boys) do not get chance to attend schools in Terai is that they need to work for their masters to pay the debt. But the debt never gets repaid because of the high and random interest a master fixes.

6. The surname or a family name shows in which caste a Newar belongs to.

7. For details of *ehi* and *barha*, see Allen (1982), Vergati (1982) and Kunreuther (1994).

8. For details of the Living Goddess, see Allen (1996).

9. *Lami* literally means "someone who walks or shows the way."

10. For details of Newar marriage, see Bajracharya (1959) and Ishii (1995).

11. Betel nuts symbolise the confirmation of engagement in Newar societies. The groom party sends ten betel nuts wrapped under a brocade pocket kept in a silver box to the bride party as a gesture of confirmation, along with many varieties of sweets and fruits, displayed each variety on a separate tray. The author had witnessed two events where a young wife returns her 'marriage betel nuts' and puts them on the dead husband's body, in Kathmandu. The informants for Lewis (1995) and Gellner (1991) also confirmed about such customs but only for 'young' girls.

12. Nevertheless, one should also remember that the question asked in the survey was "Did you discuss FP with your husband in the past year?" All women may not need to discuss FP in the previous year. It is likely that some women may be pregnant in that year; some women may not have started relationship yet because of their tradition; some women may be in the process of getting pregnant (or they want children); and some women may already be menopausal or had hysterectomy and so there was no need to discuss about family planning.

13. Although 30% of Tharu households also has 3-5 children under 5 years, this number is not alarming as in the case of Muslims because most Tharus live in large extended families. Thus all children under 5 years may not belong to only one couple as might be the case of the Muslims.

14. Elderly women expressing as "Do not produce many children, two are enough," "It does not matter whether you have girls or boys," "Girls will look after you better in old age than boys in this modern era," "A healthy child is more important than a number of children" are common among the Newars of Kathmandu. A qualitative research of various ethnic groups would most probably reveal similar kinds of expressions now-a-days.

15. In most cultures, parents have a share of ancestral property when the property is divided among the sons. In the old age, whoever looks after the parents or whichever son's family the parents choose to live with receives the property of the parents. The parent/parents may choose to take their property and live separately if they so desire.

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APPENDIX 5.1: Population of Nepal by Major Ethnicity and Mother Tongue, Census 1991.

Ethnicity	Population	Percentage of population in census	Percentage of population that speak mother tongue	Mother tongue
Brahmin*	2,388,455	12.92	12.92	Nepali and other
Chhetri*	3,267,555	17.67	17.67	Nepali and other
Newar**	1,041,090	5.63	3.7	Newari
Gurung**	449,189	2.43	1.2	Gurung
Magar**	1,339,308	7.24	2.3	Kham; Magar
Tamang**	1,018,252	5.51	4.9	Tamang
Rai**	525,551	2.84	2.4	Rai
Limbu**	297,186	1.16	1.4	Limbu
Muslim, Churaute*	654,833	3.54	1.1	Urdu, Churaute and other local
Tharu, Rajbansi*	1,276,401	6.90	5.4	Tharu; Rajbansi
Yadav, Ahir*	765,137	4.14	4.1	Maithali, Bhojpuri, and Abadhi
Occupational castes*	1,607,868	8.70	8.7	Nepali and other
Other hill origin#	828,286	4.48	Not known	Different languages
Other Terai origin*	3,024,177	16.35	Not known	Different languages
Foreigners#	7,809	0.04	0.04	Different languages
Total	18,491,097	100		

Source: 1. Central Bureau of Statistics, Population Monograph of Nepal, 1995, pp. 316.
2. Central Bureau of Statistics, Statistical Pocket Book, Nepal, 2000.
* Indo-Aryan language speakers
** Tibeto-Burman language speakers
# Various languages speakers

APPENDIX 5.2: Women's Marital Status and Union, Nepal, 1996.

Ethnicity	Total population in survey	Current marital status			Number of marriages		Husband's dwelling	
		Married (%)	Widowed (%)	Divorced/ Separated (%)	Once (%)	More than once (%)	Living with wife (%)	Staying elsewhere (%)
Brahmin	1146	94.1	3.1	2.8	96.4	3.6	82.3	17.7
Chhetri	1466	94.2	3.5	2.2	88.3	11.7	77.8	22.2
Newar	509	94.9	3.9	1.2	95.3	4.7	89.9	10.1
Gurung	107	94.4	2.9	2.8	88.8	11.2	81.2	18.8
Magar	596	95.0	3.0	2.0	87.4	12.6	74.0	26.0
Tamang	472	94.5	3.4	2.1	88.3	11.7	89.2	10.8
Rai, Limbu	370	92.2	2.2	5.7	87.0	13.0	80.8	19.2
Muslim, Churaute	421	96.4	1.7	1.9	94.5	5.5	88.1	11.9
Tharu, Rajbansi	670	96.9	2.2	0.9	92.5	7.5	94.2	5.8
Yadav, Ahir	319	96.6	2.8	0.6	94.3	5.7	94.2	5.8
Occupational castes	1234	93.3	4.7	2.0	87.4	12.6	78.1	21.9
Other hill origin	252	94.4	2.0	3.6	85.3	14.7	84.0	16.0
Other Terai origin	867	96.0	3.1	0.9	92.6	7.4	88.9	11.1
Total	8429	94.7	3.2	1.9	90.8	9.2	83.6	16.4

Source: Computed from the Nepal Family Health Survey, 1996 data.

APPENDIX 5.3: Employment Status of Women by Ethnicity, Nepal, 1996.

	Women's occupation					Type of Employment		
Ethnicity	Not working (%)	Agricultural (self employed + employee) (%)	Sales (%)	Professional, technical, managerial (%)	Other (%)	All year (%)	Seasonal (%)	Occasional (%)
Brahmin	18.5	73.1	3.8	2.4	2.2	38.7	59.3	2.0
Chhetri	10.8	83.5	1.8	1.2	2.7	41.5	56.5	2.0
Newar	22.8	51.8	9.8	3.9	11.7	47.6	47.3	5.1
Gurung	10.3	72.9	6.5	2.8	7.5	48.4	47.4	4.2
Magar	7.4	85.2	3.5	1.2	2.7	44.6	54.5	0.9
Tamang	5.9	84.1	4.2	0.6	5.2	62.3	35.4	2.3
Rai, Limbu	15.1	73.2	3.0	1.4	7.3	24.8	72.3	2.9
Muslim, Churaute	35.6	59.9	2.9	-	1.6	32.8	62.0	5.2
Tharu, Rajbansi	13.0	81.5	0.7	0.3	3.6	42.7	55.6	1.7
Yadav, Ahir	26.0	71.8	1.9	-	0.3	54.2	37.7	8.1
Occupational castes	11.6	80.1	0.9	0.3	7.1	33.5	62.4	4.0
Other hill origin	7.1	85.7	2.4	-	4.8	49.4	47.7	3.0
Other Terai origin	30.0	65.2	2.8	0.3	1.7	49.3	44.8	5.9
Total	16.2	75.6	2.9	1.1	4.2	42.2	54.6	3.2

Source: Computed from the Nepal Family Health Survey, 1996 data.

Note: Under occupation, 'other' includes skilled and unskilled manual work
'-' signifies 'none.'

APPENDIX 5.4: Household Size and Under 5 Children by Ethnicity, Nepal, 1996.

Ethnicity	Percentage of each ethnic group that has the following household size				Percentage of each ethnic group that has the following no. of under 5 children in the household			
	1-5	6-8	9-11	12+	'0' child	1-2 children	3-5 children	6-8 children
Brahmin	41.0	42.3	12.3	4.4	40.1	53.4	6.5	-
Chhetri	41.2	40.9	13.2	4.8	34.3	57.1	8.5	0.2
Newar	39.0	37.6	16.3	7.1	40.7	50.1	9.2	-
Gurung	51.4	35.5	11.2	1.9	31.8	64.5	3.7	-
Magar	44.5	37.2	12.6	5.7	30.1	58.3	11.6	-
Tamang	41.7	38.6	11.4	8.3	25.5	63.1	10.0	1.5
Rai, Limbu	41.0	36.1	15.1	7.8	31.4	55.9	11.6	1.1
Muslim, Churaute	30.4	34.4	17.6	17.6	19.3	56.4	23.6	0.7
Tharu, Rajbansi	17.8	33.3	13.7	35.2	18.1	45.0	30.3	6.6
Yadav, Ahir	37.2	28.8	23.4	10.6	31.7	56.4	11.9	-
Occupational castes	43.4	35.5	16.4	4.7	28.7	60.9	10.0	0.4
Other hill origin	39.7	33.3	13.5	13.5	21.4	62.3	16.3	-
Other Terai origin	39.0	36.2	15.2	9.6	31.8	54.8	12.0	1.4
Total	38.9	37.3	14.5	9.2	30.9	56.1	12.1	0.9

Source: Computed from the Nepal Family Health Survey, 1996 data.
Note: '-' signifies those who do not have 6-8 children under 5 years.

APPENDIX 5.5: Place of Residence, Illiteracy, Facility, and Autonomy Factors for Women by Ethnicity, Nepal, 1996.

Ethnicity	Place of residence		Illiteracy	Watches TV every week	Who decides how to spend her money			
	Urban	Rural			Respondent	Her husband	Jointly with husband	Other (some other relative or jointly with a relative)
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Brahmin	14.1	85.9	51.7	19.4	40.4	11.1	45.5	3.0
Chhetri	6.0	94.0	75.5	11.0	35.1	9.9	48.6	6.3
Newar	32.4	67.6	59.5	46.0	45.5	9.9	32.7	11.9
Gurung	17.0	83.0	59.8	10.3	61.5	-	30.8	7.7
Magar	3.9	96.1	75.5	8.6	41.2	7.8	51.0	-
Tamang	9.5	90.5	87.1	13.2	54.1	9.8	36.1	-
Rai, Limbu	4.9	95.1	74.9	9.5	58.7	-	34.8	6.5
Muslim, Churaute	7.6	92.4	95.5	5.9	34.9	11.6	44.2	9.3
Tharu, Rajbansi	2.5	97.5	91.2	9.0	19.3	15.7	49.4	15.6
Yadav, Ahir	0.3	99.7	95.9	5.3	16.7	8.3	75.0	-
Occupational castes	4.9	95.1	91.5	4.6	38.9	11.1	42.2	7.8
Other hill origin	1.6	98.4	88.5	4.0	51.5	-	42.4	6.0
Other Terai origin	9.0	91.0	91.0	10.6	27.8	15.3	41.7	15.2
Total	8.4	91.6	79.1	12.3	39.1	10.2	43.0	7.7

Source: Computed from the Nepal Family Health Survey, 1996 data.
Note: "-" signifies "none"

Chapter VI

The Main Determinants of Infant Mortality in Nepal[a]

Introduction

The infant mortality rate[1], known to be a good and sensitive indicator of the development of a nation, has been a focus of study in Nepal recently. This sensitive indicator is influenced directly and indirectly by a number of factors. In difficult situations, adults and the elderly may be able to survive better than infants, whose immune systems may be less able to cope with the environment. For this reason, infants are affected the most by the availability of health facilities, life style of the family, affordability of good food, sanitation, etc. In developing countries, infant mortality accounts for a relatively higher proportion of all deaths, whereas in the developed countries, it represents an increasingly small segment of total mortality (Klinger, 1985). Furthermore, lower infant mortality means that fewer children need to be born to achieve a certain number that will survive (Weeks, 1994). Thus, infant mortality has a significant role to play in the demographic transition of a nation.

There has been a debate for many years among demographers and public health scientists about the contribution of socio-economic development and the medical facilities provided by public health programmes in the reduction of mortality (Arriaga and Davis, 1969; Preston, 1975; Caldwell, 1979). The relatively rapid mortality reduction in Latin America, Africa, and Asia in the mid-twentieth century was attributed to the use of antibiotics and malaria control (Stolnitz, 1955). In Sri Lanka, 23 percent of the total national post-war decline in mortality was accredited to malaria control (Gray, 1974). Frederiksen (1968), however, had a different view of the dramatic decline in Sri Lanka's mortality rate in 1946. He provided evidence that economic development, by increasing per capita food consumption, was an important factor. On the other hand, the control of infant mortality through widespread education programmes contributing to an increase in literacy among women and health consciousness is believed to be the major factor in the reduction of mortality in the state of Kerala, India (Nayar, 1985).

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[a] A version of this chapter has been published. Suwal 2001. Social Science & Medicine, 53(12): 1667-1681

Caldwell (1986) has a similar view, giving credit to improvements in education and health as the determinants of low mortality in developing countries in the twentieth century. But in a country such as Nepal where social norms are complex, socio-economic status is low and medical facilities are often out of reach for most of the population, the socio-economic factor or the public health programme alone may not explain the slow pace in reducing infant mortality. In the case of Nepal, these factors are indeed interrelated to one another, and both seem to have an impact on infant mortality. The significant drop in the infant mortality rate from about 250 per 1000 live-births in the mid-fifties to about 130 per 1000 live-births in the mid-seventies (Table 6.1) is, perhaps, the outcome of the malaria control programme of the 1950s and the small-pox eradication campaign of the 1960s. Nevertheless, judging from the 1960s and 1970s age distribution in Nepal, a dramatic decline in the death rate was observed in the generation before the country opened the door to international contact and before health programmes were introduced (Taylor and Taylor, 1976). Among several other factors, a massive internal migration has been taking place in Nepal in recent decades, mostly from the mountains to the foothills and flatlands (Gurung, 1998). Such movements within the country, especially from rural to urban areas, could also have made a difference in infant survival in Nepal.

Infant Mortality Rate (IMR)

Population scientists classify mortality broadly as two types: endogenous and exogenous. Endogenous mortality is presumed to arise from genetic causes such as degenerative diseases (cancer, heart disease, diabetes, etc.) and from causes related to early infancy such as birth injuries, congenital disorders, premature births, and postnatal asphyxia. Exogenous mortality, on the other hand, is presumed to arise from environmental or external causes such as infections and accidents. The former type of mortality has a biological character and dominates the deaths in the elderly population and in infancy, particularly in early infancy. The latter class of mortality is viewed as relatively preventable and treatable (Shryock et al., 1976).

Considering the infant deaths only, when medical care is less available, post-neonatal deaths exceed neonatal deaths (deaths occurring in the first 28 days of birth). On the other hand, in societies in which medical care has achieved low death rates, it is the post-neonatal deaths that have been reduced the most. This results in a majority of all infant deaths being neonatal, caused by physiological and organic weaknesses (Bogue, 1969), of which the most severe cases succumb to death in the early neonatal stage.

The infant mortality rate in Nepal (for the census year 1991) was very high at 97.5 per 1000 live-births (Central Bureau of Statistics, 1995). However, the Population Reference Bureau, Inc., USA (1995) estimates Nepal's IMR as 102 per 1000 live-births, which is third highest in the South Asian region with 138 for Bhutan, 108 for Bangladesh, 91 for Pakistan, 74 for India, 52 for the Maldives, and 19.4 for Sri Lanka. According to a recent estimate among the 75 districts of the country, an infant mortality rate as low as 32 per 1000 live-births is estimated for Mustang district (in the Central Mountain Region), whereas the rate for Mugu district (in the Western Mountain Region) is the highest at 201 per 1000 live-births. Kathmandu district, the capital of Nepal, on the other hand, has an infant mortality rate of 34 per 1000 live-births (RECPHEC, 1997).

According to the 1991 census, Nepalese infants comprised 3.1 percent of the total population; that is, 565,413 out of 18,491,097 people. Current estimates from various surveys show that as many as 49 percent of all infant deaths occur in the neonatal period, and a little less than half of these occur in the early neonatal (within seven days of birth) stage (National Planning Commission/UNICEF, 1992). Quite contrary to Bogue's thesis noted above, the high percentage of neonatal deaths in Nepal is not due to a reduction of post-neonatal deaths with more health-care availability, but to causes such as congenital abnormalities, premature births, birth injuries, tetanus infections, and low birth weight (National Planning Commission /UNICEF, 1992). In the post-neonatal stage, the most prominent causes of death are acute respiratory infection[2] and diarrhoea.

Previous studies on infant mortality suggest that among the three geographical regions of Nepal, the mountain area had the highest infant mortality, followed by the Terai (flat areas), with the hills having the least infant deaths (Gubhaju et al., 1987; Gubhaju, 1991). An earlier study on the mortality differential in rural Nepal also found that in 1975 and 1978 the hill area had a higher child survival rate than the Terai area (Tuladhar and Stoeckel, 1983). Infant mortality was found to be lower for literate mothers than that for illiterate ones (Shrestha et al., 1987; Gubhaju et al., 1987). The risk of dying of first order births was attributed to the higher proportion of very young mothers (Gubhaju, 1991). Some contradictory results were found regarding the birth orders. Infant mortality was found to decline with higher birth order in one study (Gubhaju et al., 1987), while another study showed a higher risk of dying during infancy for high order births (Gubhaju, 1991). However, regardless of the birth order and the birth interval, the death of the previous sibling before the birth of a baby raised risk of dying for that baby (Gubhaju et al., 1987; Gubhaju, 1991).

Contrary to the popular belief and findings from other developing countries, indications of sex discrimination were not found in Nepal (Gubhaju, 1984; Gubhaju, 1991); in fact, male babies were found to have rather a higher risk of dying (Gubhaju et al., 1987). Estimates of infant mortality rates by sex computed by different individuals and surveys over the past five decades also support this finding (Table 6.1). Among other results, higher production of cereal per capita depressed infant deaths, while a larger population to health worker ratio and higher female labour force participation increased infant mortality (Shrestha et al., 1987). Tables 6.1 and 6.2 present a short time series of the infant mortality rate in Nepal.

It is clear from these data that the infant mortality rate shows a declining trend. A similar trend is noticed for infant mortality by gender as well as by rural and urban residence. However, the trend is not consistent.

Rationale of the Study

The main purpose of this chapter is to analyse the determinants and consequences of infant mortality in Nepal with the objectives of analyzing the effects of socio-economic variables such as ethnicity, religion, education of the mother, education of the father, occupation of the mother and occupation of the father, various demographic and health-care related factors on infant mortality, the rural/urban differential, and the risk of lifestyle factors on infant mortality.

Research findings from this chapter are expected to be of significant importance to assess the current situation of the country in terms of the health and survival of infants and how the deaths of infants who are the future manpower of the country can be prevented. The major work in the area of infant mortality in Nepal is that of Gubhaju (1991) who used 1976 Nepal Fertility Survey data. However, prenatal visits and immunization variables were not included in the 1976 survey. For the current study, this chapter uses 1991 survey data and incorporates some additional variables such as religion, ethnicity, and health care utilization.

This chapter will provide valuable insights into unexplored aspects of socio-economic, demographic, and health-related factors on infant mortality in Nepal. Nepal was isolated from the outside world until 1951. The development of its infrastructure, including educational institutions, hospitals, primary health care, roads, and so on took place only after the early 1950s. This chapter contributes to a better understanding of how mortality change relates to such factors, consequently, to the demographic and epidemiological transitions of the country.

Table 6.1

Infant Mortality rate by Sex, Nepal, 1954 to 2001

Source	Period of Estimate	Infant Mortality Rate Per 1000 Live-births		
		Both Sexes	Males	Females
Vaidyanathan and Gaige, 1973	1954	-	260	250
Worth and Shah, 1969	1965-66	152	-	-
Gubhaju, 1974	1961-71	-	200	186
Central Bureau of Statistics, 1974	1971	172	-	-
Gubhaju, 1984	1973-74	171	-	-
Demographic Sample Survey, 1976	1974-75	133	141	123
Nepal Fertility Survey, 1977	1976	152	-	-
Demographic Sample Survey, 1977	1976	134	128	138
Demographic Sample Survey, 1978	1977-78	104	110	98
Central Bureau of Statistics, 1985	1978	144	147	142
New Era, 1986	1981	117	136	111
Fertility and Family Planning Survey, 1986	1983-84	108	117	98
Demographic Sample Survey, 1987	1986-87	107	-	-
Nepal Fertility, Family Planning and Health Survey, 1991	1989	98	105	91
Central Bureau of Statistics, 1995	1991	97	94	101
Central Bureau of Statistics, 2002	2001	64*	-	-
Nepal Demographic and Health Survey, 2001	2001	64**	-	-

Source: Population Monograph of Nepal, 1995, pp106, National Planning Commission Secretariat, CBS, Kathmandu. * Nepal in Figures, 2002, CBS, Nepal. ** Ministry of Health, 2002.

Note: "-" indicates "data unavailable."

Table 6.2

Infant Mortality by Urban-Rural Residence, Nepal, 1962-2001

Source	Infant Mortality Rate per 1000 Live-Births		
	Period of Estimate	Urban	Rural
Nepal Fertility Survey, 1976	1962-71	127.0	167.0
Demographic Sample Survey, 1976	1974-75	57.1	134.8
Demographic Sample Survey, 1977	1976	52.8	136.1
Demographic Sample Survey, 1978	1977-78	67.2	105.1
Nepal Fertility Family Planning Survey, 1986			
(Direct Estimate)	1982-85	63.0	97.0
(Indirect Estimate)	1982-83	56.0	111.0
Demographic Sample Survey, 1986-87	1986	82.1	110.6
Nepal Fertility Family Planning and Health Survey, 1991			
(Direct Estimate)			
(Indirect Estimate)	1981-91	60.4	100.2
	1989	69.0	105.0
Nepal Demographic and Health Survey, 2001	1991-2001	50.1	79.3

Source: Population Monograph of Nepal, 1995, pp 113, Central Bureau of Statistics, Kathmandu.

Determinants of Infant Mortality: Theoretical Bases

Many factors affect infant mortality; the factors may be different for developing and developed countries. The major factors that affect infant mortality in Nepal are discussed below.

Socio-economic and Culture-related Factors

A mother's education, occupation, family income, place of residence, religion, and ethnicity may have a tremendous impact on infant mortality. The knowledge gained through education will not only enable mothers to have a greater awareness of sanitation and a more hygienic way of living, eating and providing nutritious food and to use health care facilities and family planning more, but also to have improved skills and more self-confidence, to marry late, to take up well paid jobs, to break traditional rules, and to be more exposed to the media and other information which may have a favourable impact on infant mortality (Caldwell, 1979; Ware, 1983; Niraula, 1994).

On the other hand, the much discussed human development indicator, GNP, may not affect mortality directly because it is simply a measure of the rate of production of new goods and services. Nonetheless, GNP is likely to influence mortality indirectly through its effects on food, sanitation, housing, medical care, education, etc. (Preston, 1975). In his study on inequality of income and infant mortality in underdeveloped countries, Flegg (1982) suggested that it may be difficult to achieve a rapid decline in infant mortality rates in such countries because of their low priority on enhancing women's education, although such countries do achieve a more equal distribution of incomes.

Another factor, 'participation of women in the labour force,' may affect infant mortality in a positive or negative way. The infants may have a higher chance of survival because of extra expenditures for their well being as a result of their mothers' paid jobs or a lower chance due to a lack of care and infrequent breastfeeding (Shrestha et al., 1987). The chance of survival also depends on the family income because the accessibility to a doctor, hospital, good food, and sanitation depends not only on availability but also on affordability. In a study done in Kenya, Mosley (1983) found that the changes in mortality of children from birth to age two over time and between regions could largely be explained by differences in maternal education and family income. Another factor, "place of residence" (rural versus urban), may influence the health and wellbeing of the infants because the lack of infrastructures such as electricity, running water and toilets, basic health care facilities, and poor and unsanitary housing conditions may be life threatening to the infants in rural areas.

Also, the different norms and beliefs of some orthodox religions which encourage families to have more babies or discourage the use of contraceptives, nutritious food, modern medical practices, etc. may play a significant role in shaping infant health and survival. Religion has been found to determine a country's achievement of superior or poor health (Caldwell, 1986), which consequently affects infant survival. Although there have not been any studies done on Hindu country Nepal, other developing countries that are predominantly Buddhist such as Thailand, Burma, and Sri Lanka were found to be in the superior health achiever group (Caldwell, 1986); these countries also have relatively low infant mortality rates compared to other developing countries (IMR for Thailand is 35 per 1000 live-births, 48 for Burma, and 19.4 for Sri Lanka) (World Population Data

Sheet, 1995). Similarly, another factor that influence infant mortality may also be the diverse ethnic groups of the country. The different traditions and cultural practices and the socio-economic backgrounds of these groups undoubtedly affect the well being of the infants.

Health Care Factors

Among the health care factors, prenatal care (in terms of medical care), especially in the rural areas, is not a traditional practice in Nepal. When pregnancy complications arise, women may first seek the assistance of faith healers rather than medical personnel, which may have adverse effects on the conditions of sick women needing immediate medical attention, the consequences of which may lead to infant deaths. Like prenatal care, postnatal care, including breastfeeding, feeding children nutritious solid food, timely immunization, sanitation and a hygienic way of living, is vital in preventing possible post-neonatal deaths. Another important determinant in the survival of infants is the place of delivery. About 80 percent of the births still take place at home in Nepal, which may be unsafe and unhygienic. These deliveries may be assisted by the traditional birth attendants, female relatives and neighbours, mothers-in-law and husbands, or in some cases, nobody at all (Levitt, 1993). The unscientific or unsanitary delivery in such cases may lead to early neonatal deaths. Studies done in Sri Lanka and Malaysia found that the high risk of neonatal tetanus deaths were associated with home delivery, especially in cases in which untrained birth attendants performed delivery, unsterilized instruments were used to cut umbilical cords and certain home-made materials were applied to unhealed umbilical stumps (Foster, 1983). In Nepal, a 1983 survey reported that about 50 percent of the neonatal deaths were caused by tetanus. A sharp decline in neonatal tetanus deaths of 75 percent in 1989 was attributed to the immunization and safe birthing practices that had begun eight years previously (National Planning Commission Secretariat, 1996).

Demographic Factors

The age of the mother is known to influence infant mortality. Infant deaths were found to be higher for mothers of young age in Nepal (Gubhaju, 1991). Many births in Nepal occur at a young age and also at over 35, which may be unsafe for both the mother and the child. Very young mothers' bodies may not be fully developed. Consequently, babies born to these mothers may be exposed to birth trauma. Also, these mothers may not be able to look after their babies in a proper way as do mature women. On the other hand, women over 35 years may have increased risk of complications during childbirth because of many aging problems as well as congenital anomalies. Another factor that influences infant health and infant death is the parity. The total fertility rate of Nepal is very high at 5.6 for the census year 1991 (Central Bureau of Statistics, 1995). Infants may suffer because of the lack of proper and sufficient care due to too many siblings at home.

Lifestyle Factors

Factors such as the "place of work" of the mother and eating, drinking and smoking habits, as well as a sanitary or unsanitary lifestyle, affect infant mortality significantly. If the mother's workplace is away from home, infants are left behind in the care of elderly grandparents, older siblings or house maids/baby-sitters who may not be able to provide "quality care" (Shrestha et al., 1987). Moreover, infants are disadvantaged by less frequent breastfeeding as well as by too early weaning.

Data and Methodology

Hypotheses

The following research hypotheses have been suggested based on a review of the relevant literature.

A. Socio-economic status, like education, occupation, and income, has a direct or indirect effect on infant mortality. It is hypothesized that the improvement in socio-economic status of a population has a positive influence on reducing infant mortality.

B. The age of mother is associated in many ways with infant mortality. Biological factors such as physiological immaturity of mothers may result in birth injuries and low birth weight in babies, both of which are directly related to high infant mortality. In this view, another hypothesis is that the increasing age of mother will have a positive effect on reducing infant deaths.

C. Urban areas have more and better medical facilities than rural areas, and urban women have more access to education, jobs, etc. In addition, their standard of living is higher than that of rural women. Since all of these factors affect infant mortality, another hypothesis is that residing in urban areas has a positive influence on decreasing infant mortality.

D. High parity may mean less infant care, a greater economic burden and a low birth interval. This also affects the mother's health inversely; consequently, unborn babies and newborns will be disadvantaged. Thus, the next hypothesis is that high parity results in a negative impact on the reduction of infant deaths.

E. Pregnant mothers' health care has a direct effect on the unborn baby. Thus, medical advice and nutritious food are essential for delivering a healthy baby. Attendance of a doctor, nurse or trained midwife is necessary for a safe delivery. Similarly, seeking a doctor's advice, timely vaccinations, sanitation, etc. are other factors necessary to save infants from the risk of dying. Hence, the hypothesis is that the utilization of health care services has a positive effect on decreasing infant mortality.

In addition to these factors, this study will also look at the impact of ethnicity, religion, and the mother's work place on infant mortality. The importance of the influence of these variables is felt because of the diversified cultures of the different ethnic and religious groups existing in the country. As women have been participating in both traditional home-based and traditional/non-traditional outside work, it is also felt relevant to study the differential between the impact of the two categories of workplace on infant deaths with the new data to find out whether there has been any change in impact over time. However, some important factors such as breastfeeding and low birth weight (LBW) could not be included in the analysis. There were too many missing cases for breastfeeding, and no data for birth weight in this survey. However, infant mortality has been linked to low birth weight by recent surveys in Nepal (National Planning Commission Secretariat/UNICEF, Nepal, 1998; Ministry of Health, 2002). Nevertheless, foreign doctors serving in Nepalese villages confirmed that it is not the birth weight, per se, that kills infants in Nepal, the real killer is the premature birth of babies (reference through personal contact).

Data and Survey Design

The data used for this chapter are from the Nepal Fertility, Family Planning, and Health Survey, 1991, conducted under the Demographic Health Survey (DHS), which contains information on 25,384 individuals, of whom 5.3% were from urban areas and 94.7% rural ones. The individual sample unit is the woman in the age group 15-49 who is living with her husband and who slept in a sample household the night before the interviewer's visit. For details about the 1991 survey data, see Chapter IV.

The variables used for this chapter are drawn from the individual data of the survey, except for living condition variables that are selected from the household survey data. The samples for this chapter are drawn from 50% of the urban and 5% of the rural cases out of the survey data to have an equal representation of women from urban and rural areas[3]. The sample size selected by SPSS random sampling method was 1859.

Statistical Model

For analysis purposes, infant mortality (infants dying versus not dying) is the dependent variable. The independent variables selected are place of residence, ethnicity, religion, education of mother, education of father[4], occupation of mother, occupation of father, age at first marriage[5], prenatal care, postnatal care, standard of living, place of delivery, parity, delivery assistance, and place of work. First, correlation coefficients are computed to study the relationship between the independent variables, and also to trace any multicollinearity that may have existed between the variables. In the second phase, the effect of each independent variable on infant mortality, controlling for other variables, is studied using logistic regression analysis.

Since the dependent variable is dichotomous (the probability of dying versus the probability of not dying), logistic regression is selected to analyse the data[6]. The following model is used for this study.

$$\log [p/(1-p)] = a+b_1X_1+b_2X_2+\dots\dots\dots+ b_{15}X_{15}$$

The dependent variable is represented by log $[p/(1-p)]$, where p is the probability of deaths of infants in the first year, "a" the intercept term, X_1, X_2,........, X_{15} are the independent variables, and the coefficients b_1, b_2,......., b_{15} are the changes in log odds associated with a one-unit change in the independent variables respectively.

That is,

$$\log [\text{probability (dying)}/\text{probability (not dying)}] = a+b_1X_1+b_2X_2\dots\dots\dots+ b_{15}X_{15}$$

This equation could also be written in the additive form, as

odds ratio, $[p/(1-p)] = e^{a+b1X1+b2X2+\dots\dots\dots+ b15X15}$ or in the multiplicative form, as

odds ratio, $[p/(1-p)] = e^{a}.\ e^{b1X1}.e^{b2X2}\dots\dots\dots e^{b15X15}$

The signs (directions) of slopes have the following meaning: if b_1 is negative, X_1 has a negative effect on infant mortality; if b_1 is positive, then the effect of X_1 is positive.

Measurement of Variables

For logistic regression, residence is measured as a dummy variable with urban as 1 and rural as zero. Education of mother and father are measured by the highest grade completed by the mother and father respectively. Age at first marriage is measured in actual years. Parity is measured by the actual number of births to the respondent. Place of work is another dummy variable representing 1 when the mother works at home and 0 when she works away from home[7].

A dummy variable is created to measure the place of delivery, where 1 represents the deliveries occurring at hospitals, health centres, health posts and clinics, and 0 represents deliveries occurring elsewhere (mostly at home). Another dummy variable is created to measure the standard of living, where 1 represents the use of piped water, a hand-pump and a flush toilet in the household and 0 for others.

The measurement of categorical variables is done in the following way. Three dummy variables are created for ethnicity representing four categories, namely Brahmin and Chhetri, Newar, Mongoloid group (Gurung, Magar, Rai, Tamang, and Sherpa), and "all others," with the reference category as Brahmins and Chhetris. Similarly, for religion, three dummy variables are created for Buddhists, Muslims, and others with the reference category as Hindus[8]. Occupation of mother and father are both measured as four categorical variables, creating dummy variables for cottage industry and business, service[9], and all others, with agriculture as the reference category.

Prenatal care is measured by combining two variables: (a) visit to a doctor, (b) visit to a nurse/midwife. Two dummy variables are created with 'visit to a doctor' as 1 and 'no visit' as 0 for the first variable, and 'visit to a nurse/midwife' as 1 and 'no visit' as 0 for the second variable. This categorical variable now takes three values 0, 1, and 2, where a value of 0 means "no visit to medical personnel," a value of 1 means a "visit to either a doctor or nurse/midwife," and a value of 2 means a "visit to both a doctor and a nurse/midwife." In the same manner, postnatal care is measured by combining three variables: (a) received BCG vaccination, (b) received polio drops, and (c) received measles vaccination. Three dummies are created for variables (a), (b), and (c). Thus, in this case, the variable "postnatal care" takes values 0, 1, 2, and 3, where 0 means receiving "no vaccinations," 1 means "receiving one of the three immunizations," 2 means "receiving two of the three immunizations," and 3 means "receiving all three immunizations." Delivery assistance is measured by combining two variables: (a) assistance given by a doctor, and (b) assistance given by a nurse/midwife. This variable takes the values of 0, 1, and 2 where a value of 0 means "no assistance of medical personnel," a value of 1 means "assistance of either a doctor or a nurse/midwife," and value of 2 means "assistance of both a doctor as well as a nurse/midwife."

Findings

The infant mortality rate was found to be 114 per 1000 live-births from the sub-sample data used in the study, a value which is somewhat higher than the census rate. The women in sub-sample gave birth to 6330 live-births in total. The descriptive statistics for the variables used in the analysis are given in Table 6.3. When the zero-order correlations of all the relevant independent variables were studied, except for "delivery assistance" and "place of delivery" variables, none showed multicollinearity (Appendix 6.1)[10]. Before determining the effect of each relevant independent variable controlling for other variables, individual logistic regression was fitted for each of the fifteen variables (Table 6.4). In Table 6.4, the constants give the log odds of infant deaths corresponding to the value of zero for the independent variable.

Table 6.3

Descriptive Statistics of Non-Categorical Variables Used in the Analysis, for the Sub-Sample of DHS, 1991 (Nepal)

Variables	Mean	Standard deviation
Infant deaths (probability of dying versus not dying)	0.114	0.3179
Education of mother (years of schooling)	7.410	3.280
Education of father (years of schooling)	9.310	12.150
Place of residence (urban=1, rural=0)	0.376	0.484
Place of work (mother working at home=1, mother working away from home=0)	0.076	0.266
Age at marriage	15.520	3.760
Parity (number of children ever born to the respondent)	3.410	2.370
Place of delivery (delivery occurring at health centre=1, elsewhere =0)	0.080	0.272
Standard of living (use of piped water, hand-pump, and flush toilet = 1, else =0)	0.052	0.222

The results show that as the education level of the mother increases, the odds (the relative ratio of the probability of infant death to survival) are reduced by a multiplicative factor of .8581; in other words, for each year of education, the odds are reduced by 15%. When the infant's mother works at home, the odds of dying are reduced by a multiplicative factor of .6136 (a 39% reduction). The effect of age at marriage on infant mortality shows that for every year increase in age at marriage, the odds of infants dying are decreased by 0.06%. As parity goes higher, for one more birth, the odds increase by 23%. If the delivery takes place at a medical centre, the odds of infant deaths are reduced by 45% (Table 6.4).

Looking at the categorical variables (Table 6.4), in reference to agricultural occupations, we see that the odds of dying for infants whose mothers are in the business and cottage industries are reduced by a multiplicative factor of .6763 (a 33% reduction); for mothers in service by 58%; and for mothers in "other" occupations by 34%. But for fathers, the odds are reduced significantly by 35% only for those who are in service, compared to those in agricultural occupations. Delivery assistance by medical personnel shows decreased odds; however, only assistance by both a doctor and nurse/midwife shows a significant decrease of 53%. As is evident from the effect of postnatal care, compared to no vaccination, odds are reduced by 34% for those who had two of the vaccinations and by 25% for those who had all three kinds of vaccinations.

The ethnicity result shows that compared to Brahmins and Chhetris, odds for Newars decrease by 55%. In contrast, "all others" have a significant increase by 32% in odds compared to the reference group. As for religion, only Buddhist babies have a significant reduction in odds of dying (by 30%) compared to Hindus.

Table 6.4

Logistic Regression on Infant Mortality for Individual Effects of Different Independent Variables without Controlling for Other Variables

Independent Variables	Constant	B	Exp (B)	Significance
Education of mother	-1.7028	-.1531	.8581	.0001
Place of work (home)	-1.9155	-.4884	.6136	.0128
Occ of mother (ref.agri.)	-1.8840			
business+cottage ind.		-.3911	.6763	.0294
service		-.8670	.4202	.0408
all others		-.4032	.6682	.0000
Occ of father (ref.agri.)	-1.9653			
service		-.4224	.6555	.0004
Age at marriage	-1.1966	-.0584	.9433	.0000
Parity	-3.1724	.2039	1.2261	.0000
Place of delivery(med.cen.)	-2.0228	-.5841	.5576	.0057
Delivery assist (ref. no med. Assist.)	-2.0186			
both doctor & nurse/midw.		-.7501	.4723	.0018
Postnatal care(ref.no vacc)	-1.9664			
two of the vaccinations		-.4122	.6622	.0129
all three vaccinations		-.2790	.7566	.0118
Ethnicity (ref.Brah+Chhe)	-2.0966			
Newar		-.7853	.4560	.0000
others		.2845	1.3290	.0015
Religion (ref. Hindu)	-2.0267			
Buddhist		-.3520	.7033	.0247

Note: Only the results of those variables whose effects are statistically significant are shown in the table.

Table 6.5 shows the logistic regression result of independent variables on infant mortality, controlling for other variables. The finding that as parity goes higher, the odds of infant death increase (an increment of 21%) are still highly significant. Odds significantly decrease by 26% for urban infants compared to rural babies.

Compared to no prenatal care, seeing a doctor or nurse/midwife and seeking both a doctor's and nurse/midwife's help significantly increase odds by 38% and 76% respectively. This was not expected. Compared to no vaccination injected, those infants who had two or more vaccinations show decreased odds of 39% and 27% respectively. However, receiving only one inoculation was not significant in reducing the odds (Table 6.5).

Among the ethnic groups, Newars still show a significant reduction in odds by 38% in comparison to Brahmins and Chhetris. In contrast, compared to the reference group, all "other" ethnic groups together still demonstrate a significant increase in odds by 31% (Table 6.5).

In addition, logistic regression was fitted separately with interaction terms "age at marriage*parity" and "education of mother*parity," entering each interaction term one at a time in different model equations. The results of interactions in both the models were insignificant. Other interaction terms were not considered because of very low number of cases of infant deaths included in the analysis process when interactions were entered.

Table 6.5

Logistic Regression on Infant Mortality, Controlling for Other Variables

Independent Variables	B	Exp(B)	Significance
Parity	.1925	1.2123	.0000
Residence (urban)	-.2980	.7423	.0059
Prenatal care (ref. no prenatal care)			
doctor or nurse/midwife	.3233	1.3817	.0469
both doctor & nurse/midwife	.5684	1.7654	.0295
Postnatal care (ref. no vacc)			
two of the vaccinations	-.4785	.6197	.0047
all three vaccinations	-.3138	.7306	.0079
Ethnicity (ref. Brah+Chhe)			
Newar	-.4663	.6273	.0145
Others	.2743	1.3156	.0051
Constant	-2.8611		
-2 Log-Likelihood	4270.5		
Model Chi-Square	222.8		
d.f.	16		
N	2123		

Note: Only the results of those variables whose effects are statistically significant are shown in the table.

Discussion

Except for father's education, place of residence, availability of clean water and flush toilet in the bathroom, and prenatal care, all other independent variables selected have a significant effect on infant mortality in the expected direction when the effects are studied for each variable separately (Table 6.4). As found in the previous studies (Shrestha et al., 1987; Gubhaju et al. 1987; Thapa, 1996), mother's education shows a strong negative influence on infant mortality (the higher the education of the mother, the lower the infant mortality). Unfortunately, due to many missing cases, this could not be tested in terms of the mother's education alone. From the mother's occupation point of view, occupations other than "agriculture" reduce infant mortality. These findings are consistent with those from the previous studies done on Nepal and other developing countries (Jayachandran and Jarvis, 1983; Jayachandran et al., 1985; Gubhaju et al., 1987; Shrestha et al., 1987; Thapa, 1996; Majumder et al., 1997).

Occupation of father shows that high income group families experience less infant mortality than do low income groups (those in service versus those in agriculture). Babies whose mothers work at home have a greater chance of survival than those whose mothers work away from home. This finding supports the previous result of a study by Shrestha et al. (1987). Survival of infants is higher as the mother's age at marriage increases. If the delivery takes place at a medical centre and also if it is assisted by both a doctor and a nurse/midwife, infant mortality is significantly decreased. Analysis of religious differentials reveals that Buddhist babies have a greater survival probability than do Hindu babies (Table 6.4). However, the effects of 'occupation of father,' 'age at marriage,' 'delivery assisted by doctor and nurse/midwife,' and 'religion' disappear when effects from other variables are controlled, suggesting that these variables are mediated by other social factors (Table 6.5). In other words, each of these variables alone does not affect infant mortality.

Regardless of controlling for other effects or not, the more children a woman has (parity) the higher the odds of infant deaths are, as shown in Tables 6.4 and 6.5. Place of residence did not show a significant effect on infant mortality when the effects of all other factors were present. Once the influences of other factors are controlled, a highly significant effect of the place of residence on infant mortality is revealed: babies in rural areas have lower chances of survival compared to those in the urban areas, suggesting that the place of residence is an important factor in determining the infant mortality in Nepal (Table 6.5). This evidence supports the findings of a study done in Bangladesh (Majumder et al., 1997).

Prenatal care does not show a significant influence on infant mortality, although its relationship is in the expected direction. Surprisingly, when all other variables are considered, seeking a doctor's and/or a nurse's/midwife's care shows a significant positive effect on infant mortality (the more prenatal care, the higher the mortality) (Table 6.5). This result supports the notion that women seek medical care mostly for pregnancy complications, especially in the rural settings, the consequences of which may have led to a higher infant mortality. The support for this notion seems strong when we look at the results carefully, in particular the 76% increase in the odds of infant deaths when seeking both a doctor's and a nurse/midwife's help, a substantial increase compared to the 38% increase in odds when seeing only a doctor or a nurse/midwife, indicating the severity of pregnancy complications in the former case. Another explanation may be that the number of prenatal visits is not included in the data, which is very important for obtaining significant results concerning prenatal care. There may be explanations other than those mentioned above for this unexpected finding of the effect of antenatal care on infant mortality, which may be an interesting research question to be explored in the future[11]. On the other hand, babies who have two or more than two immunizations have greater chances of survival even when other effects are controlled (Table 6.5).

Among the various ethnic groups, Newar babies have a greater chance of survival compared to Brahmin and Chhetri babies. Ethnicity is not a strong factor in the case of Mongoloid infants. Compared to the reference group (Brahmins and Chhetris), infants in "other" ethnic groups have a higher chance of dying (Table 6.4). These results still hold true when all other factors in the main equation are controlled (Table 6.5). The higher chance of survival of Newar infants may be due to lifestyle, eating habits, and the practice of traditional but nurturing prenatal and postnatal care[12].

All the hypotheses are supported by the findings except for the 'prenatal care' section in the fifth one. The fourth hypothesis that infant mortality increases as parity increases is supported quite strongly (Table 6.5)[13] .

Conclusion

The infant mortality rate in Nepal, currently at 64.2 per 1000 live-births, is indeed high (Central Bureau of Statistics, 2002). Although public health personnel and demographers disagree about the contribution of socio-economic development and public health programmes in reducing mortality (including infant mortality), in an underprivileged, traditional and culturally diverse country such as Nepal, infant mortality is found to be determined by both socio-economic and healthcare-related factors. Demographic, geographic, and ethnic (cultural) factors also influence infant mortality. This finding is in line with the Conceptual Model (Figure 1.1) given in Chapter I.

It was found that place of residence, parity, ethnicity, and immunization are the main predictors of infant mortality in Nepal. These results suggest that those who are living in urban areas, who are from Newar families, who have fewer children, and whose infants are immunized (with two or more than two of BCG, polio, and measles immunizations), share a lower probability of experiencing infant deaths. Other factors that affect infant mortality are education, occupation, age at marriage, place of work of mother, place of delivery, and access to delivery assistance. Unlike in other developing countries religion and income (as measured by the father's occupation in this study) showed weaker effects on infant mortality.

This chapter suggests that some of the conclusions drawn from the experience of Sri Lanka, Kerala, and Costa Rica by Caldwell (1986) in the mid-eighties are also applicable in Nepal. That is, low mortality will be achieved with sufficient female autonomy, considerable inputs into health services, education, universal immunization, and provision of pre- and postnatal care. The findings are also in line with the view of Ruzicka and Hansluwka (1982), who argued that rather than individually, social and economic improvement, together with the diffusion of public health and preventive measures, resulted in mortality decline in the developing countries of Asia (Ruzicka and Hansluwka, 1982).

From the First Five Year Plan (1956-61) to the Eighth Five Year Plan (1992-1997), limited attention has been paid to the health sector in Nepal. The current expenditure on health is only 3.6% of the total development expense (Sigdel, 1998). Because of such low investment on health and also the very low physician/population ratio of 1:13,698 in 1993/94 (1:32340 in 1978) (Nepal Human Development Report, 1998), a number of social scientists have suggested that the significant decline in mortality may not have come directly through improved health care delivery in Nepal (Hellen, 1981). The influences of malaria control programmes, Family Planning, and Maternal and Child Health Projects could have contributed more to the mortality decline, especially infant and child mortality (Hellen, 1981).

Nation-wide intensive family planning and immunization coverage are needed. At present, only 36% of Nepalese infants had all three immunizations. And only 28.5% of married women in the reproductive ages used any family planning device, including sterilization (Ministry of Health, 1997). While 98.3% of women have knowledge of modern family planning methods, only 26% of them use a modern method; and only 28.5% use any method at all (modern or traditional). The unmet need for family planning has been recorded at 31.4% (Ministry of Health, 1997). Further study is needed to better understand the link between family planning patterns of women and infant mortality.

The positive effect of prenatal care on infant mortality (the more prenatal care, the more infant deaths) was not expected. Because of the background and setting of Nepal, this finding may be unique to the country. If the finding that there is a higher probability of infant deaths when women seek medical help during pregnancy is indeed due to the fact that women see medical personnel only when pregnancy complications arise, then the planners of the country need to give serious thought to the condition of pregnant women. Prenatal classes should be conducted for women and their spouses countrywide.

And the men and women should be motivated to attend such classes. In addition, the ongoing mid-wife training needs to be expanded to include consultations with pregnant women apart from delivering babies safely.

There may be other reasons for women's not seeking prenatal care except for pregnancy complications. Health centres may be far from where they live; medical personnel and equipment may not always be available; medication may be unaffordable; women may be over engaged in their daily chores without leaving any time for them to visit health centres; and, they may hesitate to visit such centres because of the predominantly male staff and the hostile behaviour of the medical personnel (Niraula, 1994). In such situations, it would be a good approach to send a mobile midwife's team (consisting of trained females) to each village to visit women door to door.

A detailed study on Newar culture and lifestyle and infant mortality may shed light on why Newar babies have greater survival probabilities than those who belong to Brahmin and Chhetri ethnic groups. Is it the greater female autonomy of Newar women (Dhugel, 1980; Pradhan, 1981; Majupuria, 1987; Kunreuther, 1994), their higher literacy rate (48% compared to the national female rate of 25%) (Central Bureau of Statistics, 1993), their lifestyle or their tradition of nurturing newly-borns and caring for new mothers that contributes to the better survival chances of their infants[14]? These remain unexplored questions.

Another highly significant finding is that infants in urban areas of Nepal have greater chances of survival than infants in rural areas. In view of the overwhelmingly rural population of the country, the government of Nepal needs to implement a policy of extensive decentralization of development, such as building infrastructure for health, education, and income-generating activities. Even though the Eighth Development Plan (1992-1997) focuses more on the rural population of the country, there are still many villages where electricity and running water are not yet available, and girls are not sent to school.

It is hoped that the findings of this chapter will help guide policy planners to achieve the goals of Nepal's development plan. As discussed here, the planners and policy makers of Nepal should not only concentrate on improving socio-economic and health-related aspects of the country but also on exploring the cultural (lifestyle) and demographic aspects of the population. In other words, planning and spending more on rural development than on urban; encouraging girls to attend school and women to attend adult literacy classes that consequently motivate them to use health care facilities and family planning devices and to send their daughters to school; making health care facilities available; and studying the cultures and lifestyles of different ethnic groups of the country are some of the interventions that could be implemented in addition to the existing national development and health-related programmes. Implementation of such programmes will definitely speed up the demographic and epidemiological transitions in Nepal.

Endnotes

1. Infant mortality rate is defined as the number of deaths to infants under one year of age per 1000 live-births in a given year.

2. Acute Respiratory Infections are a group of upper and lower respiratory tract illnesses caused by bacterial, viral or fungal infections (Ewbank, 1993).

3. Selecting 50% of urban and 5% of rural cases may give biased results. But it was felt necessary to do so to obtain sufficient cases for variables such as education (rural women

tend to have a lower level of education), occupation (women in rural areas are most likely to have only agriculture-related and small cottage industry-related work), and ethnicity (certain ethnic groups reside mostly in cities and some groups in the mountains only).

4. Although, infant caring is solely done by mothers in general, the education of father showed a positive impact on infant and child survival (Tuladhar and Stoeckel, 1983). This effect may be due to better income and better information on health care, leading to better decision making in terms of medical care. For these and other reasons, "education of father" is included in the analysis to study its effect on IMR.

5. Due to the limitation of data coverage, "age at first marriage" is analysed as a proxy variable for "age at first birth" and interpreted accordingly.

6. This model is better than the multiple regression one because the predicted values in multiple regression may be in the range of minus infinity to plus infinity. Since the values do not fall in the interval between 0 and 1, they cannot be predicted as probabilities. Moreover, when the dependent variable can have only two values, it is unreasonable to assume that the distribution of errors is normal (Norusis, 1994).

7. Regardless of cash earning or not, "working at home" includes agriculture-related work (if the farm is just outside the house), usual cottage industries such as weaving, curio carving, etc. and traditional family businesses such as taking care of shops located on the main floor of the house and so on; "working away from home" includes agriculture-related work (if the farm is away from home) and all kinds of menial or professional or administrative work that requires time away from home.

8. Muslims are an ethno-religious group in Nepal. The Brahmins and Chhetris are considered to be the high caste groups among the Hindus. The Newars are the aboriginals of the Kathmandu Valley. The Mogoloid groups are mainly the hill and mountain dwellers.

9. Occupation "service" represents professionals, technicians, government officials, etc. in Nepal.

10. This problem of multicollinearity is automatically solved as the two collinear variables are not entered in the same equation. Since five of the variables, namely 'education of mother,' 'education of father,' 'occupation of mother,' 'mother's place of work,' and 'place of delivery' had too many missing cases, all fifteen independent variables could not be entered into one logistic regression model.

11. One reason for this result may be due to endogeneity problem, because the choice variables such as 'prenatal care' and 'delivery assistance' are entered as independent variables in the logistic regression (for reference, see Bollen et al., 1995).

12. However, interpretation of this result should be done with caution because Newars have many ethnic sub-groups with different cultural practices, lifestyle and traditional occupations. The data do not tell us which ethnic sub-groups are included for the survey.

Nevertheless, Newar women, in general, are known to have more authority and freedom than their Brahmin and Chhetri peers (Bista, 1976; Majupuria, 1987). Besides, good food is a priority for Newars not only during festivals and rituals that are celebrated often, for the whole year long, but also in everyday life. Pregnant women are given special care and the first share of food. It is customary for relatives to bring pregnant and new mothers a variety of rich food including meat, sweets, rice flakes, and yoghurt.

Women stay at their natal home for at least two months of postnatal care. For two to three months after child delivery, women are given at least three specially prepared nutritious meals a day both at the husbands' and the natal home. Women usually are not allowed to do household chores during this period. New mothers and babies get a separate room to stay during this period, where other family members would not interfere. Mothers and babies are given oil massages twice a day for at least two months. Most often, babies are given oil massage for a year. Babies are also given slow light exercise after each massage. About ten days after birth, infants are given a small amount of a herbal mixture called "Ghoti chauthi." It is mixed with the mother's milk and fed to the baby. The herbal mixture is fed to clear the baby's chest and throat congestion, and to remove gas. It is given to the baby until he/she is about six months of age. Mothers are given a herbal digestive medicine called "Kwati-wasa" to control gas formation during this period. Normally, women drink boiled and cooled water during the postpartum period, some continue to drink it for a year. Furthermore, Newar women are encouraged by the elders to breastfeed their babies. The age-old traditions are practised even today.

(This information on Newar women and culture is based on Dhungel, 1980; and also on the author's own experience and observation of more than three decades in the Newar community)

13. Although, the impact of education on infant mortality is included as a part of socio-economic hypothesis, it should be noted that this has been tested before by a number of social scientists.

Apart from the effects of these factors, there are others such as breastfeeding, birth weight, nutrition, and age at first birth that directly and indirectly influence infant mortality. Because of the paucity of data, the impact of these factors on infant mortality could not be studied.

14. However, the female literacy rate for Brahmins is also relatively high at 47%, but the rate is only 28% for Chhetris.

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APPENDIX 6.1 Zero-order Correlation Coefficient Table for the Independent Variables

Variables	1	2	3	4	5	6	7	8	9	10	11
(1) Residence	1.0000										
(2) Education of mother	.3616 (.000)	1.0000									
(3) Education of father	.1292 (.000)	.1881 (.000)	1.0000								
(4) Age at first marriage	.1022 (.000)	.3948 (.000)	.0331 (.280)	1.0000							
(5) Parity	-.0877 (.000)	-.1727 (.000)	-.0190 (.537)	-.2397 (.000)	1.0000						
(6) Antenatal care	.2656 (.000)	.1471 (.002)	.0677 (.027)	.1364 (.000)	-.1136 (.000)	1.000					
(7) Place of delivery	.3042 (.000)	.2444 (.000)	.0652 (.034)	.1769 (.000)	-.1223 (.000)	.5750 (.000)	1.0000				
(8) Delivery assistance	.3063 (.000)	.2441 (.000)	.0699 (.023)	.1642 (.000)	-.1329 (.000)	.6103 (.000)	.9131 (.000)	1.000			
(9) Immunization	-.0365 (.115)	.0737 (.130)	.0014 (.963)	.0416 (.073)	.0050 (.831)	.2918 (.000)	.2459 (.000)	.2590 (.000)	1.0000		
(10) Standard of living	.1774 (.000)	.2709 (.000)	.0486 (.113)	.1042 (.000)	-.0595 (.010)	.0676 (.004)	.1436 (.000)	.1443 (.000)	.0075 (.747)	1.0000	
(11) Mother's work place	.2540 (.000)	.0302 (.693)	-.0307 (.450)	-.0550 (.052)	-.0208 (.464)	-.0857 (.002)	-.0536 (.059)	-.0712 (.012)	.0085 (.763)	-.0071 (.803)	1.0000

Note: Probabilities are shown in parentheses.

Chapter VII

Maternal Mortality in Nepal: Unravelling the Complexity[a]

Introduction

According to estimates by the United Nations Population Fund (2000), over 585,000 women die annually worldwide from complications associated with pregnancy, abortion, and childbirth. It is only in recent years that research exploring maternal deaths in developing countries has revealed the true extent of this tragedy (Graham et. al., 1989). In excess of 99 percent of all maternal deaths in the world occur in the least developed countries. Asia alone accounts for more than half of all maternal deaths, with three-fourths of the deaths in Asia taking place in Bangladesh, Pakistan, and India (Basch, 1990). In some rural areas of South Asia, of every two women who die, one will have died of maternal causes (Royston and Armstrong, 1989). The maternal mortality ratio (MMR) for developing countries ranges from 0 to 1100 per 100,000 live-births, whereas for developed countries the range is 0 to 50 (United Nations, 2000a). The disparity in maternal mortality among countries is higher than for any other health indicator.

Within the last 60 years, a drastic decline in maternal mortality has taken place in North America, Australia and most parts of Europe. The maternal mortality ratio of Australia in 1935, 500 per 100,000 live-births (United Mission to Nepal, 1993a) similar to that of Nepal today, was reduced to 5 per 100,000 live-births by 1995 (Population Action International, 1995). It is claimed that such low levels of maternal mortality in developed countries have been achieved as a result of good obstetric care and low fertility rates (Fortney, 1987).

Strategies to deal with high maternal mortality in developing countries have often been omitted from social and health development policies. Why has this happened? In this chapter, relevant literature will be reviewed; the situation of maternal mortality in Nepal will be explored; and the available data will be analysed to examine the differentials in maternal mortality by age, parity and place of residence, and across the different regions, ethnic groups, and religions of the country, and to determine what factors among these affect maternal mortality the most.

Maternal Mortality in Nepal

The Nepal Family Health Survey (1996) estimates Nepal's maternal mortality ratio to be 539 per 100,000 live-births. This figure is the highest among the South-Asian countries (Table 7.1). High maternal mortality is the main reason for lower life expectancy at birth for women than for men in Nepal. For the first time, questions on maternal mortality were included in the 1991 Nepal Family Planning and Health Survey under Demographic Health Survey. This national survey estimated Nepal's maternal mortality ratio as 515 per 100,000 live-births.

Estimation of maternal mortality levels is complicated, especially in a country such as Nepal where physical and health infrastructures are inadequate, and complex traditional cultures predominate. Also for the first time, the Ministry of Health has set up

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[a] A version of this chapter has been submitted for publication. Suwal & Trovato 2002. Social Biology.

a target of reducing maternal mortality to 400 from the 1991 estimate of 515 per 100,000 live-births by the year 2000 (Ministry of Health, 1997a).

Table 7.1

Maternal Mortality Ratio for Selected South-Asian Countries, 1998

Country	Maternal Mortality Ratio per 100,000 live-births
Bangladesh	440
Bhutan	380
India	410
Maldives	350
Nepal	540
Pakistan*	-
Sri-Lanka	60

Source: United Nations, 2000a, The World's Women, 2000: Trends and Statistics
Note: * Data not available for Pakistan.

In 1993, a National Plan of Action for the Safe Motherhood Programme was published by the government of Nepal as an outcome of the Global Safe Motherhood initiative taken in Nairobi Conference in 1987 (Ministry of Health, 1996). The main focus of this programme was to improve maternal care services including family planning at all levels of the health care delivery system, and to improve the status of women. This programme also planned to establish a functioning referral system for women who need immediate attention. So far, there have been only two national level surveys on maternal mortality that were included as a part of Demographic Health Survey. Table 7.2 provides a brief summary of maternal mortality estimated so far.

The estimates fluctuate substantially according to the areas of study, the year of study, and the duration when maternal deaths occurred. For example, the Kavre district and especially remote areas such as Jumla district have extremely high maternal mortality ratio; estimates from hospitals and semi-urban areas of Lalitpur district (one of the three districts in the Kathmandu Valley) are relatively low while the national level survey estimates for 1991 and 1996 are intermediate between very high and low.

A detailed survey on maternal morbidity and mortality done in three districts of Nepal in 1998 (Ministry of Health, 1998) found that among 132 women who had died during reproductive stages, 28 % died due to pregnancy-related causes, 25.7 % due to delivery-related, and 46.2 % during postpartum period with maternity-related causes. Haemorrhage was found to be the number one cause of death. Altogether 48 women died of haemorrhage, mostly during postpartum period. Among those who died after delivery, most died within seven days. In fact, among those who died after the placenta has been removed (N=61), 24 died within a day, of which 67 % died within six hours.

This study (1998) also found that the main avoidable factors that could have prevented maternal deaths were "institutional delay in treatment," "institutional inappropriate treatment," and "lack of blood (to be transfused)," followed by "delay in bringing patient to the health facility," and "institutional delay in diagnosis" (Ministry of

Health, 1998). A delay in seeking care was also reported by the study. The study also found that the husband and/or his family members are the chief decision makers to seek

Table 7.2

The History of Maternal Mortality in Nepal for Different Places and Years as Shown

Year of Study	Maternal Mortality Ratio (per 100,000 live-births)	Duration of Maternal Deaths	Place of Study	Conducted by
1977/78	850[1,3]	21 months	Rural areas of Kathmandu, Rupandehi and Kavre Districts	Family Planning and Maternity, Child Health Centre
1986	189[2]	1979-1985	Hospitals of Nepal	Dr. D.B. Malla
1989	968[3]	-	Sindhupalchawk District	Bahunpati Family Welfare Project
1990	1217[4]	1980-1990	Kavre District	Survey Team from Tribhuvan University Teaching Hospital and Institute of Medicine
1991	87[5]	-	Patan Hospital	Dr. G. Rana
1991	200[6]	-	Maternity Hospital, Thapathali	-
-	1500[7]	-	Jumla District	-
1991	515[8]	10-14 years prior to Survey	Nepal	Nepal Fertility, FP and Health Survey, Ministry of Health
1993	454[9]	10-14 years prior to Survey	Four VDCs (Village Development Committees) of Lalitpur District	UMN, Community Development and Health Project.
1993	92[10]	10-14 years prior to Survey	Ward no.6,7,8,9,11, and 12 of Lalitpur District (semi-urban areas)	UMN, Community Development & Health Project
1996	539[11]	1990-1996	Nepal	Family Health Survey (Under Demographic Health Survey) Ministry of Health.

Source: 1, 2, 8 Nepal Fertility, Family Planning and Health Survey, 1991, Ministry of Health, Nepal.
3 Presern (1992), Nursing Times (Feb. 26), 88(9): 64-65.
4 Rijal et. al. 1991. Journal of Institute of Medicine, 13: 109-118.
5, 6, 7, 9, 10 United Mission to Nepal (UMN), 1993, Community Development and Health Project.
11 Nepal Family Health Survey, 1996, Ministry of Health, Nepal.

care during pregnancy and delivery complications, whose decision often comes only after the situation has turned worse. Among the informants 42% said the reason for not seeking care was because of lack of knowledge, about 29% did not seek care due to accessibility problems such as the location of health centre being too far and lack of transportation to reach the centre. It is not surprising in such situations that the study found 67% maternal deaths occurring at home and an additional 11% on the way to a health care facility. Delay in seeking help due to problems of finance, transport, cultural beliefs, and decision making has been reported by other studies also (Carlough, 1997; Sigdel, 1998). Even in a country such as Vietnam where the healthcare system is claimed to be highly developed, causes like "blood not available," and "inaccurate diagnosis or treatment" were reported to be the reasons of maternal deaths (Hieu et al., 1999).

In the case of Nepal, the first maternity hospital called Paropkar Indra Rajya Laxmi Maternity Hospital was inaugurated in 1959 in Kathmandu. This hospital was established by a famous social worker named Daya Bir Singh Kansakar after the then Queen Indra Rajya Laxmi died during delivery. However, even after four decades, the number of hospitals, health centres, gynaecologists, trained midwives, trained traditional birth attendants, and obstetric equipment in health centres is not sufficient in Nepal today. Many district hospitals are unable to cope with obstetric emergencies (Presern, 1992). Among other problems, drugs are not always readily available in the hospitals, the concerned family has to purchase them, but most poor families are unable to do so. Furthermore, the health care staffs in the rural health posts are often reported as being unreliable, hostile towards local patients, and absent from the care centres (Justice, 1986;

Niraula, 1994; Carlough, 1997; Sigdel, 1998). These are some of the major causes of not seeking medical care by rural women. Moreover, sanitation, a factor that affects maternal mortality, is extremely poor in rural areas/homes. Unfortunately, almost all the deliveries in these areas take place at home (Ministry of Health, 1996/97).

Unlike the case of health personnel, traditional birth attendants (TBAs) can be found almost everywhere in the country (Levitt, 1993). Since women consult them not only for delivery assistance but also for pregnancy complications, the role of TBAs has become very important in the survival of women of reproductive age. However, those women who cannot afford the money and gifts traditionally offered to TBAs do not have opportunity to consult them. In such cases and in cases where women have no helpers at home, they even deliver alone. For these and other reasons, many women, unable to come into contact with midwives or health workers, die unattended, often in agony (Presern, 1992).

Traditionally, pregnancy is considered to be natural. Thus, regular check-ups are thought to be unnecessary, particularly in rural areas, unless there are complications. Such norms are found in other developing countries as well. The Demographic Health Survey (1991) of Egypt reported that 81% of women who sought prenatal care did so because of a medical problem in upper Egypt (Abdulla et al., 1992). According to 1996 Nepal Family Health Survey, only 24 percent of the women interviewed received prenatal care. Nevertheless, the Ministry of Health reported that the achievement of maternal services including both antenatal and postnatal cares was 138 percent for the year 1996/97, that is, such care was provided to 505,159 women with the initial target of 363,853 women

(Ministry of Health, 1996/97). However, a study done in the east hill district Okhaldhunga of Nepal found that most of the women in the study's focus group were not clear why a woman should attend the antenatal clinic (Carlough, 1997)[1]. The situation is different in Kathmandu. A report from Patan Hospital in Kathmandu reveal that contrary to the situation of 20 years ago when health personnel could not convince women to have antenatal care, now they are having difficulty handling the ever increasing number of women who come for antenatal care (Bomgaars, 1996a). On the other hand, supposing the women's awareness and demand for antenatal care are relatively greater now in all areas of the country, a question arises: would the government and the non-profit health organisers be able to handle such situations in the rural areas? It is doubtful that such demands will be fulfilled in the near future knowing the overall poor health care condition in the rural areas.

Another study conducted in Lalitpur district of the Kathmandu Valley showed that 100 percent of the women with an education of grade six or higher had regular antenatal care during pregnancy as opposed to only 44 percent with no education (United Mission to Nepal, 1992/93). Also, in Nepal, programmes on adult literacy and health, and maternal education for mothers-in-law have been found to be very successful in improving knowledge and practices concerning maternal care and in reducing risk factors (Dali et al., 1992). Programmes such as refresher training to traditional birth attendants, "Cheli-Beti" programme (programme for girls/women), and evening classes seem to bring about a change in the attitude of women. In those places where such programmes were conducted, women were more open about the concept of assisting mothers during and after delivery rather than letting women to deliver babies alone (Thapa, 1996).

Also, factors such as early marriages, frequent births (short birth intervals), and high parity are creating health hazards to Nepalese women. In rural areas, early marriage is traditional. The mean age at marriage for Nepalese women is low at 18 years (Central Bureau of Statistics, 1995). Early marriage also means early pregnancy and childbirth, both of which are harmful to very young women as their bodies may not be physiologically ready to bear children. Frequent births, then, entail repeated life-threatening processes.

Moreover, some reports show that fifty percent of all maternal deaths in Nepal are due to induced abortion (The Kathmandu Post, 1997). Abortion was illegal in Nepal until September 2002. Illegal abortion, mediated by secret and unsafe practices, may lead to complications such as haemorrhage, infection, organ injuries, vital organ failure, anaemia, menstrual irregularities, infertility, chronic pelvic pain, and psychological disturbances (The Kathmandu Post, 1997), most of which eventually result in maternal deaths. Abortion has been performed secretly by TBAs in most parts of Nepal, large numbers of who are still untrained. The unsafe, unhygienic, and sometimes fatal natures of their practices directly contribute to the high maternal mortality. Even though such abortions were risky, women were compelled to have them, primarily, because of 'economic hardship' due to too many children (Thapa et al., 1994). It was noted that an increased use of family planning had translated into dramatic reductions in abortion-related deaths in some countries such as Chile (Barnett, 1996).

Causes of Maternal Deaths

Pregnancy and delivery-related causes are among the top ten reasons for death among women of reproductive age in almost all developing countries (Winikoff and Sullivan, 1987). Maternal deaths result from both direct and indirect causes. The leading (direct) causes of maternal mortality in developing countries are haemorrhage, sepsis, toxaemia, obstructed labour, and abortion (Rosenfield, 1985). Among these, the most common causes in South Asia are haemorrhage and toxaemia (Weston, 1986). In Nepal, the main causes are identified as haemorrhage (antepartum, postpartum and abortion-related) and birth trauma (ruptured uterus, cephalo-pelvic disproportion and so on) (World Bank, 1989; Ministry of Health, 1998). As reported by the World Bank (1989) complication of pregnancy, childbirth and puerperium was the number one cause of hospital admission in Nepal in 1980/81 and 1983/84 with 47 percent admissions accountable to this cause in the latter year. According to the traditional birth attendants from different ethnic backgrounds (interviewed for a study in 18 village development committees in Nepal), maternal deaths are mostly caused by bleeding, retained placenta, weakness, tetanus, lack of care, and supernatural causes such as exorcism and the evil eye (Levitt, 1993). However, researchers admit that, even in hospitals, determining the actual causes of maternal deaths is often difficult (Boerma and Mati, 1989).

Maternal mortality is also caused indirectly by hepatitis, diabetes, malaria, infections, malnutrition, and anaemia. The indirect causes contribute to about 24 percent of all maternal deaths in the world (Weston, 1986). Among the causes of maternal deaths, most of the indirect causes are preventable. On many occasions, health experts have indeed highlighted the importance of preventive health care in Nepal. But the fact is that health care providers also have faced the dilemma of prioritizing aspects of health care: whether the emphasis should be on prevention or cures. Rural women prefer curative health care to the preventive one (Justice, 1986; Stone, 1986; Sigdel, 1998). However, even though both aspects seem to be equally important in a country where access to even primary health care is limited, preventive measure becomes highly important. In such difficult situations, maternal deaths do not have to be a consequence of a certain disease; they may occur as a consequence of lack of care. Estimates show that 70 percent of the patients who appear in clinics or hospitals in Nepal have problems, which could have been prevented (JNMA editorial, 1994). This suggests that preventive care may save a large number of women's lives during the reproductive process.

Separating Women's Health from Maternal Mortality

Traditionally, in most cultures of the world, women's health has been frequently equated with reproductive health, and more concern has been shown towards infants than women themselves (Kitts and Roberts, 1996). On the other hand, social scientists and health experts focus more on population control, often discussing contraception and family planning, rather than strategies to enhance the health and well-being of women (Kitts and Roberts, 1996). As for reproductive health, researchers in the social sciences admit that it is an important, complex, and neglected field of study in the developing countries, which has only recently been recognised as a public health problem (Boerma, 1987; Graham et al., 1989; Basch, 1990).

Nepal is no exception. Although, women are highly respected for their reproductive role in the Limbu society of Nepal (Jones and Jones, 1976); although, women represent as household-heads on account of their spouses' serving in foreign armies among the hill ethnic groups such as the Gurungs, the Magars, the Rais, and the Limbus (Jones and Jones, 1976; Messerschmidt, 1976; Hitchcock, 1980); and although, mothers are highly regarded and have a special position in Newar families (as observed in the Kathmandu Valley), in most ethnic groups, women have little self-esteem and their status must not be higher than that of men[2]. Whatever the invisible reasons, there are many factors that have a negative impact on Nepalese women's health and well-being, resulting in such overwhelmingly high figures for maternal mortality[3].

Considering the background information discussed in the literature above, an analysis of the relationship between maternal mortality and variables such as place of residence, different cultural and religious groups, regions, age at death, and parity, is done in the current study. For analysis purposes, the following hypotheses were developed keeping in mind the background of the country and the review of literature.

Hypotheses

(1) Almost all the societies of Nepal are traditional and thus, reproductive process is taken for granted as a natural one that may not need medical attention. The remoteness of different regions and the inadequacy of healthcare facilities are life threatening to women experiencing reproductive stages. The Western Region of the country has relatively more medical facilities and women's empowerment index is the highest among other regions;

the Kathmandu Valley, which has relatively high medical facilities, is situated under the Central Region; the Eastern Region is relatively prosperous with many industries; and the Far-Western Region is the most remote and the least developed of all the regions. Hence, it is hypothesised that compared to the Far-Western Region, all other regions will have higher chance of survival for women going through maternity process.

(2) Because of the difficult terrain of the country and the remoteness of the villages, we hypothesise that women in the rural areas will have higher odds of dying due to maternal causes as opposed to urban women.

(3) In Nepal, Buddhists and 'other' religious groups have more relaxed attitude towards gender roles compared to the orthodox Hindus. Buddhist women and women belonging to 'other' religions may have higher status and autonomy than their Hindu counterparts. On the other hand, Muslim women are found to have low status and autonomy in the family and the community. Such disparities may affect women's health, women's economic condition, and access for women to healthcare facilities. Thus, the next hypothesis is "as opposed to Hindu women, Buddhist women and women from 'other' religion will have lower chance of mortality from maternal causes, while Muslims will have a higher chance of death."

(4) Ethnicity has shown a remarkable influence on the survival of infants, autonomy of women, and the percentage of literate women in Nepal. Because of the different cultural practices and life-styles of the various ethnic groups in Nepal, women from different backgrounds may have varied reproductive experiences that may affect their survival. Since the Brahmins and the Chhetris have orthodox cultural background, the Newars

have a nurturing prenatal and postnatal traditional practice, Mongoloid women are treated as equals by men, "Occupational caste" women are well treated by their spouses, and Muslim women have less autonomy than those in other groups it is hypothesised that compared to Brahmins and Chhetris, women belonging to Newars, Mongoloid groups, and occupational castes will have lower probability of maternal deaths but Muslim women will have higher probability.

(5) Very young women going through the reproductive process may experience more complications because of their inexperience and because their bodies may not be fully developed as required. On the other hand, older women in age group 35-49 may have complications during child-bearing process for reasons such as tightening of muscles and hardening of bones, and other ailments of ageing like hypertension. Thus, the next hypothesis is "relative to women 35-49 years old, women aged 12-19 will have higher odds of dying during the reproductive process, while women 20-34 years of age will experience lower odds."

(6) High number of births has been linked to high maternal deaths in the developing world. As reproductive process is a very complex phenomenon, repeated processes of this event may be life threatening to women. Hence it is hypothesised that as opposed to those who have had 4 or more births, those who had '0' births, 1 birth, 2-3 births will have lower odds of dying due to maternal causes.

Data and Methodology

The data for this study are from the 1996 Nepal Family Health Survey. The primary sampling unit (PSU) for this survey was a ward or a group of wards in rural areas and sub-wards in the urban areas. The 75 administrative districts of Nepal were divided into Village Development Committees (VDCs) that were subdivided into wards and sub-wards. Altogether 253 primary sampling units were selected: 34 in the urban areas and 219 in rural. The sampling unit was the ever-married woman who was in the age group 15 to 49 years at the time of the survey. The total number of eligible women interviewed was 8,429 of which 712 (8.45%) women come from urban areas and 7,717 (91.55%) come from rural.

The information on maternal mortality was collected by the sibling survival method. That is, the eligible respondents in the survey were asked about the characteristics and survival of their siblings. If a female sibling died at age 12 and over, the respondent was asked additional questions to determine whether the death occurred during pregnancy, childbirth, or within two months after delivery (Ministry of Health, 1997a). Unfortunately, due to the paucity of questions related to maternal mortality in the survey, only a limited statistical analysis could be executed. Cross tabulations are computed between the social, demographic, and geographic variables and maternal deaths. The regional, spatial, demographic, ethnic, and religious differentials in maternal mortality are analysed. In the second section, effects of different factors (mentioned above) on maternal mortality are analysed by using Logistic Regression. For this survey, maternal deaths are defined as deaths that occurred during pregnancy, childbirth or within two months after birth or termination of a pregnancy (Ministry of Health, 1997a).

The dependent variable is dichotomous in nature; it is the ratio of women (12-49 years old) dying of maternal causes versus women dying of other causes[4]. The independent variables are region, place of residence, religion, ethnicity, age at death, and parity. 'Place of residence' is defined as urban or rural. 'Regions' denote the five development regions of Nepal: Eastern, Central, Western, Mid-Western, and Far-Western Regions. 'Ethnicity' consists of six groups (those with similar culture were combined as a single ethnic group): 'Brahmin and Chhetri' (the so-called high caste groups), 'Newar' (the indigenous inhabitants of Kathmandu Valley), 'Mongoloid' (five hill ethnic groups the Gurungs, the Magars, the Rais, the Tamangs, and the Limbus are included in this group), 'Muslim and Churaute' (both of Muslim background), 'Occupational caste' group (the Kamis, the Sarkis, and the Damais, the so-called untouchables from the hills), 'Tharu, Rajbansi, Yadav, and Ahir' (well-known Terai origins)[5] and all other Terai origins and hill origins as 'other.'

'Religion' is divided into four groups: Hindu, Buddhist, Muslim, and 'other.' 'Age at death' is the age of a female sibling when she died. This variable was divided into three categories: ages 12-19, 20-34, and 35-49. The "number of children ever born to a female sibling before she died" (the "parity" variable) was also included in the analysis. This variable is divided into four groups, namely, '0 child,' '1 child,' '2-3 children,' and '4 or more children.' The aforementioned variables were the only ones that were available for the analysis of maternal deaths in the survey. Dummy variables are created in each case for the above variables as shown in Table 7.3. The background information on siblings such as ethnicity, religion, place of residence, and region are assumed to be the same as that of the respondent.

A Logistic model is specified, as follows:

$$\log [p/(1-p)] = a+b_1X_1+b_2X_2+\dots\dots\dots+ \ b_6X_6$$

The dependent variable is log [$p/(1-p)$], where p is the expected (or predicted) probability of dying due to maternal causes, ($1-p$) is the expected (or predicted) probability of dying of women from other causes, "a" is the intercept term, X_1, X_2,........, X_6 are independent variables. The coefficients b_1, b_2,......., b_6 measure the changes in log odds associated with a one-unit change in the independent variables respectively.

The above model may be written in the additive form, as

odds ratio, $[p/(1-p)] = e^{a+b1X1+b2X2+\dots\dots\dots+\ b6X6}$ or in the multiplicative form, as

odds ratio, $[p/(1-p)] = e^{a}.\ e^{b1X1}.e^{b2X2}\dots\dots\dots e^{b6X6}$

Table 7.3

Specification of Variables for the Logistic Regression Analysis

Variables	Levels	Values for Dummy Variables
Region	Far Western	0 = reference category
	Eastern	1 versus reference
	Central	1 vs reference
	Western	1 vs reference
	Mid-Western	1 vs reference
Place of Residence	Rural	0 = reference
	Urban	1
Religion	Hindu	0 = reference category
	Buddhist	1 versus reference
	Muslim	1 vs reference
	Other	1 vs reference
Ethnicity	Brahmin+Chhetri	0 = reference category
	Newar	1 versus reference
	Mongoloid	1 vs reference
	Muslim	1 vs reference
	Occupational	1 vs reference
	Others	1 vs reference
Age at death	12-19	1 versus reference
	20-34	1 versus reference
	35-49	0 = reference category
Parity	No child	1 versus reference
	One child	1 vs reference
	2-3 children	1 vs reference
	4 or more children	0 = reference category

Findings

Descriptive Results

Table 7.4 shows that there is slightly high proportion of male siblings (51.6%) compared to female siblings (48.4%) in the survey. Among the dead and the living siblings also, the proportions are similar to that of the total proportions. Altogether, 26.3% of siblings died, of which 13.5% were males and 12.7% were females.

Similarly, out of all female siblings (N = 21,162), 26.3% were dead, that is 5,574 in number. And 26.2% of male siblings died out of total males, that is, 5896 in number out of 22,534. As we can see the percentage difference between the female siblings who died and the male siblings who died is marginal.

Table 7.5 shows that among the dead female siblings, 1,016 siblings were in the age group 12-49 years. In total 27.9% of these women died from all maternal causes, including pregnancy, delivery, and within 2 months after delivery. If we consider only the deaths during pregnancy and childbirth, the percentage dead in that age group is 14.5 (Table 7.5). Of the total deaths in that age group, 22.2% of deaths in the urban and 28.2% of deaths in the rural areas are attributed to maternal causes. The number of women who died of maternal causes is higher in the rural areas than those in the urban.

Table 7.4

Descriptive Information on Siblings by Sex and Survival, Nepal, 1990-1996

	Survival of Siblings				
Siblings	Dead	Percentage dead out of total deaths	Alive	Percentage alive out of total alive siblings	Total siblings
Males	5,896 (26.2%)	51.4%	16,582 (73.6%)	51.6%	22,534 (51.6%)
Females	5,574 (26.3%)	48.6%	15,571 (73.6%)	48.4%	21,162 (48.4%)
Total	11,474 (26.3%)	100%	32,153 (73.6%)	100%	43,707 (100%)

Note: Figures computed from Nepal Family Health Survey, 1996 Data.
Percentage out of total male/female siblings is shown in parentheses.

The percentage differentials of deaths by region are marginal. However, the percentage of deaths during pregnancy and delivery only is the lowest (9.6%) in the Western Region. The differentials among the different ethnic groups are substantial. The percentage of women who died of maternal causes is the highest for the Muslims (34.2%) and the second highest for the "All Terai origins" (30.9%). Mongoloid groups have the lowest percentage of deaths due to maternal causes (19.0%), second lowest being that for the Newars (26.9%). Among the religious groups, 17.1% deaths of Buddhist women in that age group are from maternal causes, which is also the lowest percentage among all the religious groups, whereas 34.2% deaths of Muslim women are accountable to maternal causes, which is the highest[6] (Table 7.5).

Table 7.5: Maternal Deaths by Characteristics of Women, Nepal, 1996

Characteristics of female siblings	Total female siblings	Total deaths of female siblings	% dead	Total deaths of female siblings aged 12-49 years	Deaths during preg. and child birth	Total deaths due to maternal and related causes (preg+ ch.birth+2 mo after ch.birth)	% dead due to maternal and related causes out of total deaths	% dead during pregnancy & childbirth out of deaths in age 12 -49 years	% dead due to maternal and related causes out of deaths of 12 -49 years
	a	b	(b/a)*100	c	d	e	(e/b)*100	(d/c)*100	(e/c)*100
By area of residence									
Urban	1,732	425	24.5	63	10	14	3.3	15.9	22.2
Rural	19,429	5,149	26.5	953	137	269	5.2	14.7	28.2
By region									
Eastern	4,825	1,110	23.0	299	39	70	6.3	13.0	23.4
Central	6,962	1,998	28.7	344	48	98	4.9	13.9	28.5
Western	4,067	980	24.1	156	15	41	4.2	9.6	26.3
Mid-Western	3,228	906	28.0	178	28	46	5.1	15.7	25.8
Far-Western	2,079	580	27.9	105	17	29	5.0	15.6	26.6
By ethnicity									
Brahmin+Chhetri	6,879	1,615	23.5	283	41	83	5.1	14.5	29.3
Newar	1,256	304	24.2	52	7	14	4.6	13.4	26.9
Mongoloid	3,872	971	25.1	179	18	34	3.5	10.0	19.0
Muslim+Churaute	1,009	283	28.0	38	5	13	4.6	13.1	34.2
All Terai origin	4,409	1,338	30.2	239	43	74	5.5	18.0	30.9
Occupational castes	3,009	865	28.7	194	32	57	6.6	16.5	29.4
Other hill origin	726	203	27.9	31	3	8	3.9	9.7	25.8
By religion									
Hindu	18,446	4,881	26.4	883	135	253	5.2	15.3	28.6
Buddhist	1,340	328	24.5	76	5	13	3.9	6.6	17.1
Muslim	1,011	283	28.0	38	5	13	4.6	13.1	34.2
Other	365	82	22.4	19	3	4	4.9	15.8	21.0
Total	21,162	5,574	26.3	1,016	148	284	5.1	14.5	27.9

Note: Computed from Nepal Family Health Survey, 1996 Data. The cut-off age for female siblings who had died is 12 years for this survey.

Table 7.6

Maternal Deaths by Age Groups, Nepal, 1990-1996

Age at death (1)	Deaths during pregnancy (2)	Deaths during delivery (3)	Deaths within 2 months of childbirth (4)	Deaths due to all other causes (5)	Total deaths of female siblings (6)
12-19	28	10	38	272	348
	(27.2%)	(22.7%)	(28.1%)	(37.1%)	(34.3)
20-34	64	25	75	310	474
	(62.1%)	(56.8%)	(55.6%)	(42.2%)	(46.7)
35-49	11	9	22	152	194
	(10.7%)	(20.5%)	(16.3%)	(20.7%)	(19.1)
Total	103	44	135	734	1016
% out of all deaths	10.1%	4.3%	13.3%	72.3%	100%

Note: Figures computed from Nepal Family Health Survey, 1996 Data.
Percentage of deaths of female siblings due to particular cause such as pregnancy, delivery, and postpartum-related (in each column) is shown under parentheses

When we look at the deaths of women by different age groups (Table 7.6), a higher percentage (46.7%) of women died in the middle age group 20-34 as opposed to the younger group (34.3% of all deaths) and the older group (19.1% of all deaths). Similarly, maternal deaths during specific periods such as pregnancy, delivery, and postpartum periods also show a highest percentage of deaths for middle age group in each period (columns 3, 4, and 5 in Table 7.6). This finding is not unexpected because more women in age group 20-34 are likely to get married and then conceive than the younger or the older groups[7]. However, of all the deaths related to maternal causes in the age group 20-34, the lowest number is accountable to delivery-related (N = 25) as compared to pregnancy-related (N = 64) and postpartum-related (N = 75) ones. The figures from columns 3, 4, and 5 also tell us that the percentage of deaths during delivery (4.3%) is the lowest for all three age groups and the highest for postpartum period (13.3%).

Table 7.7 demonstrates that among all the deaths caused by reproductive complications, the highest percentage (33.8%) belongs to those who had already given birth to 2-3 children. On the other hand, glancing at each 'child' column and concentrating on each cell by age group and parity, we see that the highest percentages of women (47.9%) died after giving birth to one child (column 3). On the surface, this may look like the first delivery and the second pregnancy having more risks to women in all three age groups (66.1%, 41%, and 20% deaths for age groups 12-19, 20-34, and 35-49 respectively in column 3 of Table 7.7). However, the breakdown of the same Table (7.7) by deaths in different periods of reproduction gives a much clear picture (Table 7.8). In general, the risk of dying seems to be high in the postpartum period for all women who had given birth to "one" child or "two to three" or "four or more" children (columns 7, 10, 13, and 16 in Table 7.8).

Nevertheless, women died more during pregnancy rather than during childbirth while carrying their first child (column 2 in Table 7.8). Compared to delivery, women also had to pay a high price during pregnancy even after they had given birth to one, two to three, and four or more children earlier (columns 5, 8, and 11 in Table 7.8). Again, because of the risk of exposure to women in age group 20-34, they are the ones who experienced more deaths during pregnancy and postpartum periods.

Table 7.7

Maternal Deaths by Age Group and Parity, Nepal, 1990-1996

	Number of deaths due to maternal causes to women who had given birth to				
Age at death (1)	'0' child (2)	1 child (3)	2-3 children (4)	4 or more children (5)	Total (6)
12-19*	28 (10.6%) N= 264	39 (66.1%) N = 59	10 (41.6%) N = 24	- N = 3	77 (22.1%) N = 348
20-34	23 (25.5%) N= 90	39 (41%) N = 95	74 (36.1%) N = 205	29 (34.5%) N = 84	165 (34.8%) N = 474
35-49	1 (25%) N= 4	2 (20%) N = 15	12 (19.7%) N = 61	26 (23%) N = 113	42 (21.7%) N = 193
Total	52 (14.5%) N= 358	81 (47.9%) N = 169	96 (33.3%) N = 288	55 (27.5%) N = 200	284 (28%) N = 1015
% dead due to maternal causes	18.3%	28.5%	33.8%	19.4%	100%

Note:
1. Computed from Nepal Family Health Survey, 1996 Data.
2. Percentage of deaths to women by parity and age group is shown in parentheses.
3. * The cut-off age of female siblings who died is 12 years for this survey.
4. N in each cell is the number of women who died in that age group (from all causes) after giving birth to the specific number of child/children
5. "-" indicates "no deaths"

Table 7.8: Maternal Deaths by Age Group and Timing of Death, Nepal, 1990-1996

Age at death	Number of deaths due to maternal causes to women (by timing of death) who had given birth to															
	'0' child			1 child			2-3 children			4 or more children			Total			
(1)	During preg. (2)	During deliv. (3)	Within 2 mnths after deliv. (4)	During pregnancy (5)	During deliv. (6)	Within 2 mnths after deliv. (7)	During pregnancy (8)	During deliv. (9)	Within 2 mnths after deliv. (10)	During pregnancy (11)	During deliv. (12)	Within 2 mnths after deliv. (13)	During pregnancy (14)	During delivery (15)	Wtn 2 mts after delivery (16)	All total (17)
12-19	1	6	1	7	2	30	1	2	7	-	-	-	29	10	38	77
20-34	16	2	5	12	8	19	24	11	39	13	4	12	65	25	75	165
35-49	1	-	-	-	2	2	3	1	7	7	6	13	11	9	22	42
Total	38	8	6	19	12	51	28	14	53	20	10	25	105	44	135	284

Note: Computed from Nepal Family Health Survey, 1996 Data.
"-" indicates "no deaths"

Logistic Regression Results

When the independent variables were entered separately one at a time, the results were as follows. Regions where the individuals lived did not show any significant impact on women's dying due to maternal causes against dying from other causes. Similarly, whether women lived in urban or rural areas did not make any difference in dying of maternal causes or other causes (Table 7.9).

Among the religious groups, compared to Hindu women, Buddhist women had lower odds of dying due to maternal causes by a multiplicative factor of 0.535 or by 47 percent. In the same manner, only one ethnic group showed a significant result. The Mongoloid groups' odds of dying from maternal causes are lower by 44 percent as opposed to those women who are from Brahmin and Chhetri background.

The effect of age at death shows that compared to those who died at age 35-49, women who died at age 20-34 had odds of dying due to causes related to reproductive complications almost doubled.

The odds of dying from maternal causes of women who had never given birth before they died decrease by almost 56 percent compared to those women who had given birth to four or more children. On the contrary, the odds of dying due to maternal causes increase by almost 2.4 times for those women who had given birth to one child before they died, compared to those who had given birth to four or more children.

Table 7.9

Logistic Regression on Maternal Mortality with Predictors Entered One at a Time, Nepal, 1990-1996

Variables	B	Exp. B	Level of Significance
Region (Ref. Far Western)			0.865
Eastern	0.185	1.202	0.478
Central	0.091	1.095	0.713
Western	-0.011	0.989	0.970
Mid-Western	-0.024	0.976	0.930
Constant	-1.018	0.361	0.000
Place of residence (urban)	-0.280	0.756	0.756
Constant	-0.934	0.393	0.393
Religion (Ref. Hindu)			0.143
Buddhist	-0.625*	0.535*	0.044
Muslim	0.273	1.314	0.435
Others	-0.459	0.632	0.421
Constant	-0.913	0.401	0.000
Ethnicity (Ref. Brahmin+Chhetri)			0.100
Newar	-0.130	0.878	0.702
Mongoloid	-0.580*	0.560*	0.012
Muslim	0.234	1.263	0.523
Occupational castes	-0.016	0.984	0.937
Others	0.052	1.053	0.781
Constant	-0.873	0.418	0.000
Age at death (Ref. 35-49)			0.000
12-19	0.023	1.024	0.914
20-34	0.655*	1.926*	0.001
Constant	-1.287	0.276	0.000
Number of births (Ref. 4 or more)			0.000
0 births	-0.810*	0.445*	0.000
1 birth	0.870*	2.386*	0.000
2-3 births	0.253	1.287	0.210
Constant	-0.961	0.383	0.000

Note: * significant, as shown by the Level of Significance.

When the effect of each predictor variable was singled out by controlling effects of other factors, the influence of "ethnicity," "age at death," and "number of births given by a woman before she died" on dependent variable all still demonstrate significant results. However, the effect of religion disappears from the scene (Table 7.10).

The odds of risk of dying from maternal causes to Mongoloid women are lower by 49 percent compared to Brahmin and Chhetri women even when all other effects are considered. The odds of dying due to maternal causes for women who died at age 12-19 is doubled, so does the odds for those who died at age 20-34, as against those who died at age 35-49.

The effects of the number of births still depict a similar picture as in Table 7.9 even when effects of other variables are held constant. The odds of dying for women from maternity-related complications are lowered by 70 percent for those who had never given birth compared to those who had four or more children before they died. Similarly, the odds of dying from maternal causes are still higher by 78 percent for those who had one child versus those who already had four or more children.

Apart from the study of effects of various variables mentioned above, effects of different interaction terms such as "ethnicity*parity" and "age at death of mother*parity" were also considered in separate models. These terms were statistically insignificant.

Table 7.10

Logistic Regression on Maternal Mortality with Effects of Other Variables Controlled, Nepal, 1990-1996

Variables	B	Exp. B	Level of Significance
Region (Ref. Far Western)			0.391
Eastern	0.412	1.510	0.151
Central	0.190	1.210	0.496
Western	0.079	1.082	0.795
Mid-Western	-0.027	0.973	0.926
Place of residence (urban)	-0.134	0.874	0.692
Religion (Ref. Hindu)			0.930
Buddhist	-0.190	0.827	0.658
Muslim	0.143	1.154	0.716
Others	-0.284	0.753	0.667
Ethnicity (Ref. Brahmin+Chhetri)			0.331
Newar	-0.214	0.808	0.570
Mongoloid	-0.660*	0.517*	0.037
Occupational castes	-0.079	0.924	0.718
Others	-0.064	0.938	0.756
Age at death (Ref. 35-49)			0.003
12-19	0.704*	2.021*	0.014
20-34	0.745*	2.107*	0.001
Number of births (Ref. 4 or more)			0.000
0 births	-1.199*	0.302*	0.000
1 birth	0.581*	1.788*	0.038
2-3 births	0.048	0.953	0.977
Constant	-1.296	0.274	0.000
2-Log-Likelihood	1105.611		
Model Chi-square	97.241		0.000*
d. f.	17		
N	1016		

Note: * significant, as shown by the Level of Significance.
N= number of female siblings who died at age 12-49, from maternal causes and other causes.

Discussion

The reported number of deaths of female siblings in the age group 12-49 was 1,016, of which 27.9 percent died due to maternal causes and the rest from other causes. Among those who died from maternal causes, 36.5 percent died during pregnancy, 15.6 percent during delivery, and 47.9 percent within two months of childbirth. Other studies also report more than half deaths occurring in the postpartum period (Li et al., 1996; Ministry of Health, 1998). During the postpartum period, the high-risk period has been reported as within a few hours after the delivery to seven days.

There is one common practice that exists among most ethnic groups in Nepal that may have beneficial outcome. Although no previous study has been done in this area, women remaining physically active throughout their pregnancy may become advantageous at the time of delivery because of relaxed muscles and other body parts. This may be one of the reasons why relatively few women died during delivery. The higher deaths in the postpartum period may be because of lack of postnatal care or because of the lingering complications that occurred during pregnancy and delivery. Although, all the deaths related to maternal causes are preventable, those deaths that occur within two months after delivery seem like an unnecessary wastage because this stage is supposed to have less risk compared to the complicated pregnancy and delivery stages. A further research is needed to investigate the reasons behind this result.

The higher percentage of maternal deaths in the rural area than in urban area may be for obvious reasons such as lack of health care facilities, low socio-economic status, and lack of communication and transportation to reach health centres. Out of every 1000 women, about 60 more women died due to maternal causes in the rural areas compared to the urban ones (Table 7.5).

Among the five development regions, the Western Region has the lowest percentage (9.6%) of deaths due to pregnancy and delivery compared to those in other regions. Although marginal, the differential in the survival status of women who had to go through maternity stages in the Western Region may have to do something with the availability of health care facilities in the region[8]. However, when the deaths during postpartum period were added, the regional percentage difference becomes marginal. Thus, unveiling the secret that postpartum period is claiming unnecessary deaths of women in Nepal and is the main culprit in increasing maternal mortality regardless of the regions where they live. The findings from Logistic regression also suggest a similar conclusion: there is no regional difference nor is there any rural/urban difference when all the deaths related to reproductive process are considered. Thus, the hypotheses related to the 'place of residence,' and 'region' are inconclusive.

The ethnic and religious differentials reveal that the social norms and cultural practices may play significant roles in determining the survival or death of women during pregnancy, childbirth, and postpartum stages. Buddhist women showed low mortality among the other religious groups. The Logistic results also support this descriptive finding. Buddhist women have lower chance of dying from pregnancy, childbirth, and related causes compared to Hindu women (Table 7.9). Buddhist women in Nepal are said to have more freedom and high status in the family than their Hindu counterparts (Fürer-Haimendorf, 1964; Bista, 1976). Hindu women from the Terai are mostly confined to farming, have less control over economic resources and household decision-making, and married away at an early age (Thapa, 1997). Lack of postpartum care and treating mothers who just gave birth to as untouchables by other family members and outsiders were reported by Hindu women from Bajura district in the Far Western Region of Nepal. These women were confined to cowshed during childbirth and postpartum care and they would look after themselves including cutting the umbilical chord (Thapa, 1996). Nonetheless, this effect disappears in Table 7.10 when effects of other selected variables were controlled. Thus, religion alone is not a strong factor that influences women's deaths due to maternal causes. Hence our hypothesis based on 'religion' could not gain a total support.

Ethnicity seems to be a strong predictor in Nepal's case. The percentage of death for Mongoloid women is the lowest compared to all other groups (Table 7.5). Furthermore, the Logistic analysis shows that the Mongoloid women have 49 percent less chance of dying from causes related to reproduction compared to women from Brahmin and Chhetri ethnicity. Although the directions of results for the Newar women, Mongoloid women, Muslims, and Occupational caste (Tables 7.9 and 7.10) indicate support for our hypothesis on ethnicity, only Mongoloid versus Brahmin-Chhetri showed a significant result. Mongoloid women probably have better mechanisms than their Brahmin and Chhetri sisters to prevent deaths related to maternal causes. Mongoloid women are known to have more authority and autonomy in the family including interacting with people and travel, working outside home or in business, and in keeping their own funding (Bista, 1976; Jones and Jones, 1976; Hitchcock, 1980; Thapa, 1997).

They have freedom in selection of a spouse, marriage, separation, divorce, and remarriage (Bista, 1976; Jones and Jones, 1976; Hitchcock, 1980). As observed in many hill areas, Mongoloid women have strong physique and have higher age at marriage compared to women in other ethnic groups (Bista, 1976; Thapa, 1997). Even though their literacy rate is relatively low compared to Brahmin and Newar women, it is still higher than their Muslim and Tharu sisters' rates (Central Bureau of Statistics, 1993).

Moreover, Mongoloid women have good relationship with their mothers-in-law. And mothers-in-law treat them well and do not expect the daughters-in-law to serve them like in other orthodox ethnic groups. Furthermore, because most Mongoloid men serve in the British Army and Indian Army, their family income may be substantially higher compared to the Brahmin and the Chhetri families. In addition, these men may be better informed about reproductive health because of their interaction with foreign media and people. Most importantly, they may pass such information to their spouses. Being free and open with men and outsiders, Mongoloid women probably benefit more in the area of reproductive health.

Socially Brahmins consider themselves on the top level and Chhetris on the second level of Hindu hierarchical caste system. But when it comes to women's issues, like in other orthodox ethnic groups women are treated as subordinates to men in these families. Moreover, mothers-in-law are dominating figures and thus daughters-in-law may not have a 'say' in the family and household decisions. How much do these features discussed above affect the low probability of dying from maternal causes among the Mongoloid women is yet an open question unanswered by this study.

What is clear from this finding is that the women's empowerment has a strong impact on reducing maternal deaths. Shiffman (2000) talked about the 'empowerment' perspective, according to which "the key to maternal mortality transition lies primarily in improving the position of women in society rather than in raising the general standard of living or making available appropriate health services" (Shiffman, 2000: 277). He argued that education of women is an important predictor of maternal mortality. Education was found to be a good predictor of risk of maternal mortality in a study done in Egypt. Illiterate women had 3.4 times the risk of death compared to women with some education (Abdulla et al., 1992). Similarly, more than 72% of the women who died of maternity cause were found to be illiterate in one survey of Nepal (Ministry of Health, 1998). Although the data in the current study does not allow us to look at women's education or other empowerment variables, Mongoloid women's background information and our findings strongly support 'empowerment' perspective of maternal mortality transition.

Age at death of women also has strong messages. More young women died during pregnancy, childbirth and postpartum period than the old women. Among the younger women, an overwhelming percentage (34.8%) of deaths was accountable to reproductive causes for age group 20-34 (Table 7.7, column 6). The results from Logistic regression support the above descriptive analysis as well. Both the younger groups of women who had died at ages 12-19 and 20-34 had higher chance of dying due to causes related to reproduction than those in the age group 35-49. This may imply many things in case of Nepal. Being young means more physical work, sexually more active, demand in other fields and activities, stress related to work, family, and reproductive process, less experience in childbirth compared to older women, physiologically not well developed to bear children, and modest and shy of talking about reproductive complications. This finding strongly supports our hypothesis on age of women.

This finding supports a previous study done on maternal mortality in a Nigerian hospital (Okonofua et al., 1992). The Nigerian study found that maternal deaths were more common among the younger women, especially the teenagers, and the deaths were not necessarily due to the obstetric risk. Delay in seeking care and most likely the low socio-economic status of younger women were blamed for the result. The findings from this study also indicated that improving the quality of care provided by the health care delivery system could lower maternal mortality by almost 40% in the university hospital where the study was conducted (Okonofua et al., 1992).

The information on parity and maternal deaths from descriptive tables show that the number of births affects maternal mortality positively to a certain point (starting from '0' child up to 2-3 children). In other words, it shows that the higher the parity the more maternal deaths. But the information does not indicate that women are at more risk of dying if they had given more births (4 or more births). The percentage of deaths drops from 33.8 for 2-3 children to 19.4 for '4 or more children' group (Table 7.7). One possible explanation that fits into this finding is the "women's reproductive experience" theory. Although high parity poses as a threat to women, their experience in reproductive process perhaps cancels out the risk associated with it. Table 7.7 (columns 3, 4, and 5) and Table 7.8 (columns 15, 16, and 17) also show that more percentage of younger women, who had given birth to one or more children, died than the older ones, who had given birth to the same numbers of children, supporting again for a higher maternal mortality among the younger cohorts.

The Logistic regression analysis from both Tables 7.9 and 7.10 strongly support the descriptive figures above. The chance of dying from maternity-related causes seems to increase for those who had given birth to one child against those who already had four or more children before they died. This may mean the high risk of reproductive complications for the first birth and the second pregnancy. The result shows that the risk is almost 2.4 times to these women when other effects also influence at the same time (Table 7.9) and 78 percent higher when other effects were controlled (Table 7.10). However, those women who died during their first pregnancy, that is, those who had not given birth to any baby before they died, had actually lower chance of dying due to maternity-related complications as opposed to those who already had four or more children, even when effects of all other factors were held constant.

As discussed above, the secret of lower probability of dying for women who already had 4 or more children may lie in the experience gained by these women during reproductive processes. For example, they are more experienced in caring during pregnancy, taking precaution, and looking after themselves during postpartum period compared to women who had gone through reproductive process only one time or two times. On the other hand, better survival history of women who had four or more births may be a reflection of better maternal health of these women. Moreover, giving birth is easy for some women, especially for those who have large pelvic bone. For women who have difficulty in giving birth, fatality may occur during the first birth. However, the data do not have enough information on women who died of maternal causes, to analyse the relationship between women's health status and mortality. The Egyptian study (1992) showed the first pregnancy/first births having a higher risk of dying against those who had 1-4 births previously, which supports the current study findings partially.

Conclusion and Recommendations

Maternal mortality is a serious public health problem in Nepal as in other least developed countries. The maternal mortality ratio for Nepal, currently at 539 per 100,000 live-births (meaning 5 women losing their lives for every 1000 child-births) is very high. Maternal mortality, a problem of women, was long neglected, as were their other problems. The problem of high maternal mortality was noticed by the Nepalese development planners and health experts only a few years ago. Research on maternal mortality was rarely done, thus information on this topic was not available and so the severity of the problem was not known until recently.

Many women are dying of preventable causes in Nepal, especially those women who die of reproductive causes. There are several ways to save their lives. If only the three delays of 'seeking care, reaching care and providing care' could be rectified, many lives would be saved. The planners in Nepal not only need to develop an urgent policy regarding women's health and maternity care but also need to implement it immediately. In 1997, only six percent of Nepal's total budget was allocated to health sector (Nepal Human Development Report, 1998). Out of this expense how much is spent on reproductive health is anyone's guess.

Though not all hypotheses were supported, this research shows that there are more deaths at postpartum stage rather than during pregnancy and childbirth in Nepal. Being a Mongoloid woman confers a reduced chance of dying from maternal causes as compared to Brahmin and Chhetri women. Younger married women are more likely to die due to reproductive causes than those who belong to age 35-49. Compared to women who had four or more children, the chance of dying during reproductive process is higher for women who had already given birth to one child, though the chance is reduced for those who had no children earlier.

There is a clear message that the risk of dying is not over for women after the pregnancy and delivery stages. The vulnerability of complications and dying exists within two months after delivery also, especially within seven days. Studies have shown that most postpartum deaths in the developing countries including Nepal occur within six hours to seven days of delivery. The overall health condition of women may become very delicate for a few days after the delivery. How a woman's health, pregnancy, and delivery are handled may have a great impact on the complications during postpartum period and thus, survival of these women. Almost 80 percent of women still give birth at home in Nepal. Thus complications of postpartum period may not be recognised by the family members, or may recognise only when the situation has gone from bad to worse. A study done in Vietnam also found that maternal mortality is associated with home delivery (Hieu et al., 1999). The highest number of deaths in the post-delivery stage might be an outcome of the delay in seeking care, reaching care, and providing care. Some of these women may have come in contact with health care only after the situation had become worse and some, probably, did not seek medical care at all. The same conclusion could be drawn for pregnancy-related deaths that are also substantial in number compared to those related to delivery. Most of the recent studies mentioned in the text also acknowledge that maternal deaths could have been avoided to a large extent with appropriate care.

After the delivery, in addition to her usual household work and outside work, and delicate health, she has a baby to look after and breastfeed during the last period of reproductive stages. Seeking medical care may have been delayed, in some cases, also because of rural people's belief. They may believe that the complication is created by an evil eye and thus, may seek help from shamans first. However, for rural women to seek medical help, the current condition of health centres need a radical change: the healthcare staff should be available in the centres whenever needed; health centres should provide around the clock service; women need to be treated well by the staff; and health centres need to be well equipped for maternity emergencies.

It is emphasised here that the formal and informal classes on prenatal and postpartum care should be number one priority in the country. Also, since women need to be physically fit to go through reproductive process, highly nutritious food and physical movement are essential for them. Women may eat adequate food during pregnancy and postpartum period but the food they consume may not be nutritious. One of the important things the awareness classes should teach is about the nutritional information of different food and how to eat balanced food within their income capacity. In poor areas, people may not be able to afford nutritious food. Thus alternate food that is nutritious as well as affordable should be recommended. Moreover, because haemorrhage is found to be the number one cause of death in Nepal and because haemorrhage is related to anaemia, food rich in iron should be strongly recommended. On the other hand, in high mountain areas, fruits and vegetables may not grow. In such areas, what the health personnel and nutritionists should teach is how to preserve seasonal food, and how to collect good food from lowlands and dry/preserve it so that it lasts during the whole reproductive period. In addition to such classes, girls' formal schooling also becomes important to develop awareness and knowledge. A detail cause of postpartum deaths and its relationship to the complications during pregnancy and delivery should be studied urgently. If the postpartum deaths are indeed related to the earlier complications, then antenatal care and women's overall health improvement become even more important.

Among other findings, maternal mortality is strongly associated with young age of mothers. Marrying early and consequently, conceiving early is taking more lives of women than Nepalese realise. Sending young girls off in marriage is a big relief in some cultures such as in the Terai plains of Nepal where dowry and *tilak* are compulsory and where the *tilak* amount goes higher as girls grow older[9]. Chastity of girls is given a high priority in the Newar culture of Kathmandu Valley and in some other cultures and thus, parents may want to marry girls off sooner than later among such cultural groups. For Brahmin fathers, giving away a young daughter (*Kanya-daan*, literally meaning "virgin give-away") means clearing of or opening up of the door to heaven. All these social customs are affecting maternal mortality indirectly. Encouraging women to marry late (after they are 20 years or more) and to use contraceptives for conceiving later may save many lives. One way to prevent early marriage is to educate girls compulsorily. Educated girls tend to marry late in Nepal like in other countries. Educated girls seem to be bold enough to oppose their early marriage.

The relationship between parity and maternal mortality, as seen from this research, is somewhat complicated. This study does not confirm the usual findings from other developing countries where high parity is associated with high maternal mortality. What it confirms is the fact that in a country where pregnancy is not considered a 'disease' like in many developed countries, where women are not compulsorily taught antenatal and postnatal care by medical personnel, and where medical facilities are out of reach for most population, women's reproductive experience may become valuable to a great extent. The health experts and population scientists should not interpret this finding as a misleading message like "high parity lowers maternal mortality." The message here is that women's own reproductive experience has a beneficial effect on reducing their mortality related to reproduction.

Another interesting finding is about the relationship between ethnicity and maternal mortality. The findings show, without any doubt, that the life-style and different cultural practices of various ethnic groups also have a remarkable impact on maternal mortality in Nepal. The odds of dying are reduced by almost half for Mongoloid women, a highly autonomous group, as against women from orthodox Brahmin and Chhetri background. This finding supports the "women's empowerment" theory strongly. Is it only the high status and autonomy of Mongoloid women, their late age at marriage, and the affection and respect their spouses and family members give them or are there other factors such as nutrition and lifestyle that affect their mortality related to reproduction, are some questions that are worth exploring in the future for more clarification. Learning from such cultures and sharing the ideas may help in reducing maternal deaths on national level in the long run.

On the other hand, there are traditional customs such as those of the Newars, the aboriginals of the Kathmandu Valley, which are nurturing for pregnant women and new mothers. Although this research does not give any significant result from its Logistic regression analysis, probably because of Newar's relatively low number of deaths related to pregnancy and delivery, other ethnic groups can benefit from their cultural practices associated with the pre and post-natal cares. Religion, however, shows only a weak effect and possibly mediates through other social and demographic variables in having an impact on maternal deaths.

Even though the data does not allow one to analyse the relationship between healthcare-related factors and maternal mortality, there are indications that preventive-care play an important part in the survival of women during reproductive process. Furthermore, the descriptive findings suggest that the availability of health care facilities affect women's survival or death. As curative health care is limited in Nepal, in general, preventive measures become even more important. If adequate precaution is taken beforehand, reproductive risks may be reduced substantially. On the other hand, although the data does not tell us what number or percentage of these women died due to induced abortion, it is an open secret in Nepal that about 50 percent of maternal deaths are a result of induced abortion[10]. It may mean that half of these deaths could have been saved had the women have legal and safe abortion. Induced abortion-related complications may be one of the reasons why more than double the number of delivery deaths occurred in the pregnancy stage. In Vietnam where abortion is legal and easily accessible, only an insignificantly low percentage of deaths related to induced abortion were reported (Hieu, 1999).

Also, because mothers-in-law, traditional birth attendants (TBAs), husbands, and other relatives attend labour and deliveries, educating and training them on maternal health needs to be emphasised[11]. The TBAs and relatives of pregnant women should refer high-risk women to hospitals in time rather than handling the problem by themselves[12]. A nation-wide TBA training programme was held during the 1980s (Levitt, 1993). Evaluation and further improvement of such programmes become essential for better outcome. Training "Female Community Health Volunteers (FCHVs)" in mid-wifery may be yet another way to save women's lives. With fee-for–service kind of incentives to the volunteers, such programmes may turn out to be highly feasible[13]. Since more women are dying during postpartum period than during pregnancy and delivery, training and classes should emphasise on postnatal care, especially the care of seven critical days of postpartum period.

Information and research on maternal mortality are lacking in Nepal. Throughout this research, lack of studies on postpartum mortality was noted not only for Nepal but also for other developing countries. In general, many more in-depth studies are needed at the national level to analyse the effects of socio-cultural, socio-economic, demographic, geographic, and health care factors on maternal mortality. Questions concerning causes of death, numbers of antenatal visits, nutrition, income, education, occupations, age at first birth, prevalence of contraceptive use, and birth intervals should be included in future surveys[14]. Because of the diversified cultural practices and social norms, such studies should be done separately for the major ethnic groups.

Communication between the different sectors of the government such as health, planning, and population seems to be crucial. The effort of only one sector may not be sufficient in improving the reproductive health and thus bringing down maternal mortality. In addition, the ideas and experiences of rural population should be considered seriously while developing the reproductive health programmes. The authorities need to emphasise not only on implementing of reproductive health programmes but also on keeping track of their success rates and drawbacks. Implementing such programmes will help reduce the existing maternal mortality problem. As well, the continuity of such programmes is essential. The planners and policy makers of Nepal need to give high priority to the problems of pregnant women and new mothers. Pregnancy and giving birth should be a time of rejoicing; unfortunately, for many it is too often a time of mourning.

When we look at the broader issue of Nepal's demographic and epidemiological transitions, movement towards the third stage can be attained once maternal mortality has been reduced to a minimum. As already noted, the time trend of maternal mortality is not clear for the country because of insufficient time series data. The recently conducted studies give only an idea of the current situation. This study suggests that one can learn from the different cultures of Nepal to help reduce maternal mortality. Also, encouraging girls to marry later may save many women's lives. Marrying later and having a few children have already been a norm among the more educated women and among those who live in the Kathmandu Valley[15]. Clearly, women's empowerment is important. Educating girls and providing them with jobs outside their homes are two indirect ways that would serve to reduce maternal mortality. Widespread provision of prenatal and postnatal classes for family members, training Female Community Health Volunteers and traditional birth attendants in safe midwifery, and motivating faith-healers to persuade women to seek medical help in time, would no doubt also contribute significantly in the fight against maternal mortality and thus help the country move through the epidemiological and demographic transitions.

Endnotes

1. During a personal interview with a Canadian physician from Edmonton who worked as a missionary in the Ampipal Hospital in the Western Region of Nepal for more than 30 years, told the author that many infants and women died in rural Nepal simply because women do not know how to keep their premature babies warm and how to live in a hygienic and sanitary way so that infections and tetanus would not develop during and after the delivery. Information as this one tells us how essential it is to conduct prenatal and postnatal classes including the awareness classes in the country. An interesting finding related to pregnancy is that those who sought medical help during pregnancy had more infant deaths later (Suwal, 2001). This suggests that most of the women who sought medical help had pregnancy complications, as a consequence of which infants died.

2. The Newars are the aboriginals of the Kathmandu Valley.

3. Preference for sons, consequently, discrimination in care may be one of the factors that may have an adverse effect on a daughter's health in her reproductive age. But this factor is beyond the scope of this study. There is no doubt that a son is desired in most families. However, gender discrimination was not found in the Central Nepal in terms of health care use (Niraula, 1994) and both sons and daughters were wanted in most Nepalese families for different religious and traditional practices (Karki, 1988). As observed in the hills and mountain regions of Nepal, children are loved and cared in the family, especially if he/she is the youngest.

4. The cut-off age for Nepal in this Survey was 12 years. Additional information on deceased female siblings was collected if they were 12 years and over at the time of death.

5. The Terai is the flatland of Nepal located in the south. It is one of the three horizontal geographical regions of the country: the mountains, the hills and the Terai from north to the south, respectively.

6. Muslims are the ethno-religious group in Nepal.

7. Almost all the pregnancies are the outcome of married relationships in Nepal.

8. Every district in this region has a hospital (16 hospitals altogether); this region also has sufficient Ayurvedic dispensaries and care facilities (45 in number) along with 5 District Ayurvedic Health Centres and 3 Zonal Ayurvedic Ausadhalaya; it also has 4 of the 10 Missionary hospitals of Nepal with a special sector for maternity care (Ministry of Health, 1997b). Furthermore, of the 2,537 TBAs trained during 1973-1987 by various national and international agencies, the majority of TBAs, 825 in number (32%) comes from the Western Development Region. District-wise, eight of the 27 districts that had an opportunity to receive training for TBAs happen to be in this region. Low risk of death in areas with more access to health facilities was reported by a study done in Egypt (Abdulla et al., 1992).

In addition, most districts in the Western Region lie among the best districts in terms of "overall composite index of development" including female literacy, female empowerment, females in non-agricultural work, gender discrimination, infra-structural development, child deprivation and labour, and poverty (International Centre for Integrated Mountain Development, 1997).

9. *Tilak* is the amount of money and materials given compulsorily to the groom in most Terai cultures.

10. As an impact of the discussion on abortion and family planning in the United Nations International Conference on Population and Development in Cairo in 1994, Nepalese population planners and health experts made efforts to liberalize the country's strict abortion laws. In 1996 the then Chairman of the Family Planning Association of Nepal and the member of National Assembly registered a private bill called "Pregnancy Protection Bill" (Yogi, 2000; Thapa 2000). After six long years of efforts, finally the bill was passed. Abortion has been legal in Nepal since September 2002 under certain conditions: when a woman's health or life is in danger; when the pregnancy is an outcome of a rape or an incest; and when a fetal is suspected of having impairment. All abortions are allowed only within 12 weeks of pregnancy.

11. In societies such as those of Brahmins, Chhetris, Newars, and most of Terai origins, husbands or any other male person is not allowed during delivery at home. Even in

hospitals, most gynecologists are females. As a matter of fact, almost all nurses in Nepal are females.

12. According to a study on maternal and child health, signals of high-risk pregnancy are given as follows:

poor obstetric history (unfavourable last pregnancy)
high number of births (four or more)
multiple pregnancy
first pregnancy
poor age (under 18 or over 35)
poor medical conditions or illness (e.g. diabetes)
low weight
leg edema
complicated pregnancy (mal-presentation of the fetus)
anaemia or poor nutrition
inadequate spacing between births (less than two years)
short stature or poor pelvic structure
little education and poor socioeconomic status

(Wallace, 1981).

13. Female Community Health Volunteers programme was formulated in 1988 by the Government of Nepal so as to train 14,000 local women from the hills and the Terai for 12 days in the field of primary health care. With the political change in the country in 1991, the new government set up a target of 40,000 FCHVs in 1992. These volunteers were designated ten different tasks related to preventive, promotive, and curative care (Sigdel, 1998).

14. The data collected from such studies should be made available to the graduate students in Nepal and abroad for various analysis purposes so that the planners of the country may benefit from the findings and recommendations of the studies.

15. A group of Nepalese women visiting Edmonton in 2001 revealed that there has been a growing trend in Kathmandu among the educated and working women to have only one child, regardless of the child's sex.

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Chapter VIII

Regional Migration in Nepal: Beyond the Push and Pull Factors[a]

Introduction

The distribution of the Nepalese population is essentially influenced by social, historical, and environmental factors, as is the case in other developing countries[1]. These factors seem to influence the process of internal migration in Nepal. Migration in Nepal is believed to be as old as the history of its people (Shrestha, 1982). Although the regional pattern of migration is a fairly new phenomenon, internal migration has a long history. However, in view of recent volume and pattern of migration from the hills to the lowlands (Terai)[2] and from almost all parts of the country to the capital city, Kathmandu, internal migration seems to have taken a new direction. This chapter sheds light on the motivations of the Nepalese people to migrate, the segment of the population that moves the most, and the impact that this movement has on the regional and general population problems of the country.

The History of Migration in Nepal

The most important internal migration is believed to have taken place in Nepal after the country was unified by King Prithvi Narayan Shah of Gorkha in 1768. When Kathmandu was declared the capital, (the country was only a constellation of principalities before the unification), the King and his entourage moved to Kathmandu

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[a] A version of this chapter has been submitted for publication. Suwal 2002. International Journal of Population Geography.

Valley. The migration from Gorkha as well as from the nearby hills into the cultured and peaceful valley, with its pleasant climate, probably continued for some time. At the same time, the aboriginal people of the Kathmandu Valley, the Newars, who were traditionally involved in arts and crafts and business and trade, started to migrate to the newly established administrative and trade centres of the country (Malla, 1989; Tiwari, 1996). Karan (1960) over-simplified in giving his opinion that Nepal apparently was populated by large-scale migration over a period of centuries, from all surrounding areas. However, the inscribed and written evidence indicate its existence since 500 B.C. (Pandey, 1989).

Nevertheless, Nepal was relatively sparsely populated during the eighteenth century (Seddon, 1995). After the unification of the country, the government encouraged people from Tibet and Sikkim to emigrate to the northern mountainous strips of the country and the Indians to the southern Terai plains with the purpose of increasing population density, agricultural production, and government revenue from agricultural taxes (Banister and Thapa, 1981; Seddon, 1995).

The migration history of Nepal tells us that along with other people coming into the country, the Nepalese themselves have been migrating to the nearby countries of Sikkim, Bhutan, and India (especially Darjeeling and Assam) for about two centuries (Sanger, 1973; Seddon 1995). Nepalese are said to be a people on the move (Sanger, 1973). Even before the war between Nepal and the British East India Company in 1815, the latter was able to recruit some 5000 Nepalese men to its army. After the Treaty of Sugauli in 1816, the British authorities in India were entitled to appoint a Resident in Nepal and recruit Gurkha soldiers to the British Indian Army (Jain, 1959). The recruitment of hill men from Nepal into the British Gurkha Army has been an established tradition since 1857/58 when the first Rana prime-minister, Jung Bahadur Rana, sent Nepalese troops to help the British during Indian Mutiny (Seddon, 1995)[3].

In appreciation of this assistance, the British returned the far-western Terai territory that was taken away during the Anglo-Nepalese War of 1814-16, except for Darjeeling and a few other hill districts (Gaige, 1975; History of Darjeeling, 2001). Henceforth, the ruling Prime-Minister encouraged settlement in this territory and other parts of the Terai. He promised to grant the status of free men to all Nepalese slaves who would settle there. Previously, for many centuries, the rulers of Nepal used the dense and malarial Terai as an effective defence against the penetration of Indian influence. Thus, until 1860, the clearing of forests and the settling of Nepalese people were not encouraged by the government (Gaige, 1975).

In the mean time, between 1831 and 1891, it has been estimated that trade between Nepal and India increased tenfold, with nearly 40 percent of Nepal's exports going to India, mostly rice from the Terai (Seddon, 1995). While the plains areas exported agricultural produce, the hill regions continued to export manpower (Jain, 1959; Seddon, 1995). Some even called Nepal "a population exporting nation" because of the Gurkha soldiers' continued service in the Indian and British Armies (Weiner, 1973), a tradition which continue even today.

Despite the government's encouragement, most of the migration into the hills had stopped by the beginning of the twentieth century (Poffenberger, 1980). But the effort of the Nepalese government to develop the Terai economically and to settle the hill people in the region continued throughout the 1860s until 1951 (Gaige, 1975). Because of the hill people's low response to settling in the hot and malaria ridden Terai, the Rana government had to be content with letting migrants from India develop the economy of the Terai. Thus the Indian *Zamindars* (landlords) were encouraged to take Terai land and induce tenants who originated from the plains to settle there. Between the 1890s and the 1930s, the mid-western Terai was settled in this manner (Gaige, 1975).

Current Internal Migration in Nepal

Since the beginning of the 1950s, the politics in Nepal have taken a different turn. In 1951, the autocratic Rana regime was overthrown by the people. The population became free to open up schools and to take part in development-oriented work. The new government made an effort to develop the country, particularly the fields of education and health. Missionaries and foreign agencies such as USAID and WHO came forward to help in Nepal's development. As a result of such programmes, mortality rate started to decline slowly, with fertility rate remaining high. Partly because of these reasons and partly because of the return of Gurkha soldiers from World War II, the population of Nepal increased from 8.2 million in 1952/54 to 9.4 million in 1961 and, subsequently, to 11.5 million in 1971. During this period, most of the population (about 64 percent) lived in the hills and mountains of Nepal (Central Bureau of Statistics, 1995).

The new government of Nepal developed its First Five-Year Development Plan (1956-61). One of its aims was to resettle the landless poor of the hills to the south in the Terai area. The first resettlement programme, undertaken in 1954, was the Rapti Valley Development Programme, initially meant to rehabilitate flood and landslide victims from the hills. The programme, launched in Chitawan district, south-west of Kathmandu was later expanded to relieve the population pressure in the hills, to resettle landless peasants, and to partially solve the food deficit in Kathmandu Valley (Kansakar, 1979)[3]. By 1960, the project had distributed 27,759 hectares of land among 5,233 families.

Under the Rapti Valley Development project, 40 percent of the land, at a rate of 33.5 hectares per household head, was granted to government officials and farmers who hold a large amount of land (Paudel, 1979 as cited in Ghimire, 1992) in spite of the project's initial plan to resettle the landless peasants. On the other hand, in 1956 all forests in Nepal were declared state property (Edwards, 1996). The government passed the Private Forests Nationalisation Act in 1957 with the objectives of protecting, managing, and conserving the forests for the benefit of the entire country (Nepal Gazette, 1957 as cited in Bajracharya, 1983)[4].

As a result, a large section of arable land became protected forests. The mal-distribution of land under the resettlement programme and the government's protection of forests created a land scarcity for later migrants. Some of them became tenants and labourers of earlier beneficiaries, but many encroached into the forested land (Kansakar, 1979; Ghimire, 1992). In 1964, to control such encroachments and to resettle the landless peasants, the government established a planned resettlement project under the auspices of the Nepal Resettlement Company in Nawalpur district of the Terai. Later, in 1969, the Resettlement Department was established to stop encroaching and to resettle landless people on a national level (Kansakar, 1979). By the end of 1973, 1,550 households were settled through the project. Nevertheless, most settlers (43 %) were from influential castes (Brahmin, Chhetri, and Newar)[5] from the Central hills who already owned properties elsewhere (Fourier, 1976; Paudel, 1979 as cited in Ghimire, 1992)[6]. The settlers also included 299 repatriated families from Burma. While launching the resettlement programme, the government of Nepal intended not only to relieve the population pressure of the hills but also to integrate hill people into the Terai culture (mostly of Indian origin) so that it could Nepalise the area. The government was, perhaps, successful in its campaign but it also created political conflict (Weiner, 1973; Gaige, 1975).

At the same time, in 1954 a malaria project, the first of its kind, was launched in the Chitawan Valley. A few years later, in 1958, the Nepal Malaria Eradication Organisation was established as a part of a global strategy for eradication, funded by the USAID and WHO (Sigdel, 1998). In the 1960s Malaria was controlled in the Terai. Because of the success of the campaign and the resettlement programme, people from the overpopulated hills started to migrate to the Terai.

The government's plan also focused on industrial development in the Terai. By the early 1970s, 88 percent of Nepal's industrial investment was in the Terai (Gaige, 1975). Apart from its rich agricultural resources, the Terai was booming as a leading industrial area of Nepal. As a result of the various industries, on the one hand, and the opening up (in 1973) of Wildlife Conservation National Parks (Heinen and Yonzen, 1994) on the other, employment opportunities in non-agricultural areas were significant in the Terai. The landless and jobless hill migrants seized on this opportunity and thus the momentum of migration from the hills to the plains increased even more than in the past. Besides, the well-off families from the hills started to purchase large quantities of cheap land in the Terai and thus migrated seasonally.

In addition, the construction of highways had also played a vital role in the increasing migration flow from the northern hills to the southern plains. Since the early

1950s, the government of Nepal had started to build highways with help provided by India, the United States, China, England, and Russia (Singh, 1985). The First Five-Year Plan (1956-61) gave top priority to the development of transport and communications infrastructure (Jain, 1959). Beginning with a few highways linking some hill districts and Terai districts, and a few of these areas to Kathmandu, the construction of the East-West Highway linking one corner of the country to the other through the Terai plains was started (Figure 8.1).

In the early 1970s, with the realisation that Nepal's development problems were most heavily concentrated in the hill areas (as observed by the then King Birendra during his travels to remote areas), a plan to link the North and South of Nepal developed and gained credibility (Sanger, 1973). Although initially the link roads were designed to ease the hardships of people in the remote hill areas of Nepal, the planners hoped to generate greater trade between the Terai and the hills, with the Terai selling food grains in return for forest and horticultural products (Weiner, 1973)[7]. As a result of the new roads, the movement of highland people to the lowland had become routine. During his trek throughout Nepal between 1951 and 1962, Toni Hagen, a Swiss geologist, estimated that about 2 million Nepalese (nearly one-quarter of the whole population at the time) headed southward from the hills every year, either as part of seasonal semi-permanent, or permanent migrations or to emigrate to India (Hagen, 1971). Thus, malaria control, land resettlement, the opening up of the north-south passage, and industrial development in the Terai became the major motivation factors that led Nepalese people from the hills to the plains.

Existing and Planned Highways, Nepal, 1978

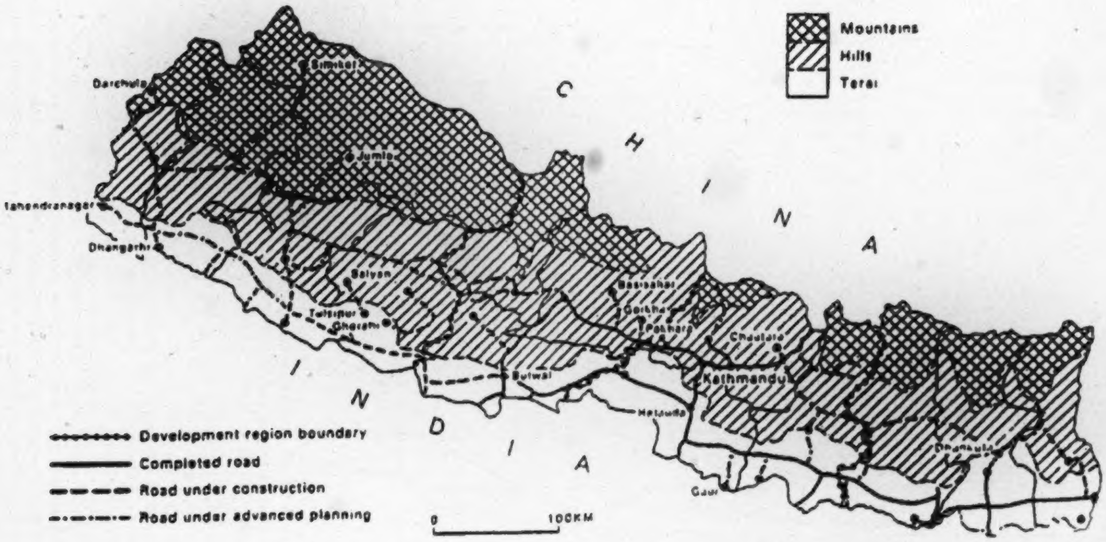


Figure 8.1

Source: His Majesty's Government, Kathmandu, 1978

Types and Patterns of Internal Migration

In general, three types of migration have been taking place in Nepal: seasonal, semi-permanent, and permanent, usually from rural to rural or rural to semi-urban areas (McDougal, 1968; Gurung, 1989). Seasonal migration takes place mainly during the slack agricultural season in winter, from October or November until March through June (McDougal, 1968; Gaige, 1975). The purpose of such seasonal migration is often to sell cottage industry products such as ghee (refined butter), herbs, and woollen rugs and to purchase cloth, kerosene, salt, sugar, and rice; and to find temporary employment as labourers (McDougal, 1968). Sherpas of the high mountains coming down to the lowlands in winter to graze their yaks and the western mountain and hill people migrating seasonally to the south border to sell horses and herbs are also common (Shrestha, 1993). The hill people who own land in the Terai also visit every year (McDougal, 1968), especially during the harvest season to take care of the crops and during winter to escape the harsh cold of the hills and valleys.

Sometimes, the hill people also migrate on a long-term basis, especially to India or to the Terai. The average stay of these semi-permanent migrants is three years. The seasonal and the semi-permanent migrants, who earn subsistence in this way, are usually the members of families with little or no land, mostly from the so-called "lower caste" (McDougal, 1968; Gaige, 1975).

Permanent migration, however, seems to occur the most. Unlike the seasonal and the semi-permanent migration patterns, permanent migration occurs between two groups of people in Nepal: first, the landless poor and, second, the wealthy that have capital to buy more productive land in the Terai. McDougal (1968) found a tendency among the poor migrants to emigrate to India and the better off to settle in the Terai. A majority of the permanent migrants are found to be landless people from the hills (Gaige, 1975; K.C., 1993). All three kinds of migration from the hills seem to occur to meet different socio-economic needs.

The migration pattern is found to vary from sub-region to sub-region and from group to group. It also varies, depending on the background history of the family. For example, the type of migration and choice of employment in the destination area seem to depend on the history of migration as a tradition in a particular area or of a particular ethnic group. Particular ethnic groups that send young men out for military service and others that send family members as seasonal migrants for labour work continue to do so, but those families who have no migratory history remain in the hills (Poffenberger, 1980).

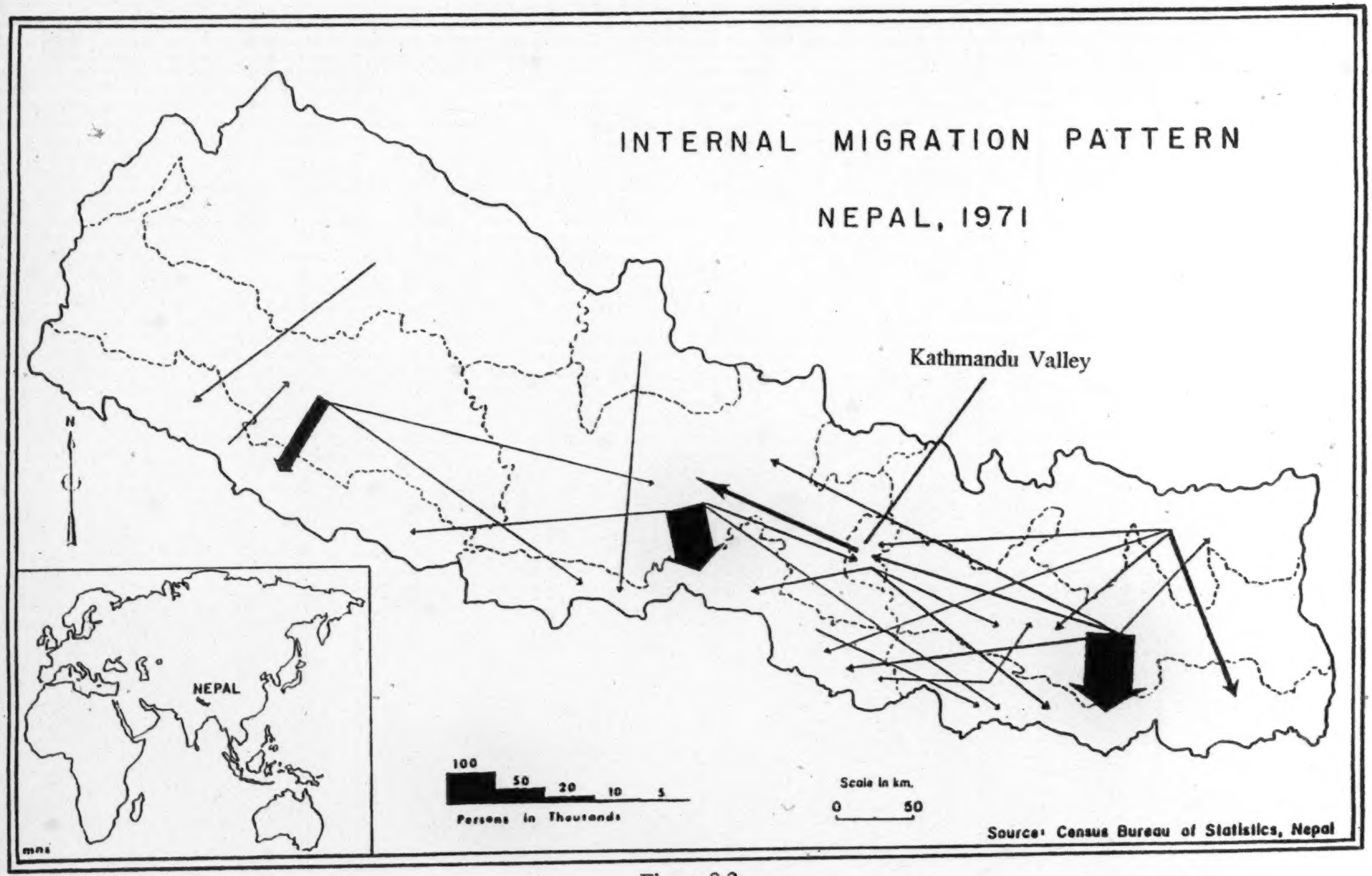
Short distance migration usually takes place from ridges to lower elevations (Tiwari, 1996) while a long distance migration involves the people from the hills and mountains moving to the adjoining Terai areas (Gurung, 1998). The volume of migration seems to be the largest for the rural-to-rural movement, while it is the smallest for the highland to the adjoining Terai. People's moving to another district rather than to other areas of the same district is on the rise. However, seeking salaried employment in foreign countries ranks number one among all the reasons for migration. Normally, large households tend to send at least one family member elsewhere for salaried jobs (Tiwari, 1996).

Apart from the highland to the lowland migration and the rural-to-rural migration, rural-to-urban migration is on the increase, especially from all regions of the country to the capital, Kathmandu. In Nepal, unlike other developing countries, migration from the rural areas into the capital city was slow until the 1970s (Figure 8.2).

However, in 1991, 28.6 percent of the urban population in Kathmandu were in-migrants[8]. The high migration into Kathmandu is also clear from the fact that in 1991, Kathmandu was comprised of only 38.2 percent Newars, once the predominant indigenous inhabitants of the city (Gurung, 1998). The largest percentage of the in-migrants to Kathmandu come from the Terai (Subedi, 1996). Such a change in the migration pattern was also noticed by a recent study of Tiwari (1996). Unlike in the past, migration from the hills and the mountains to the Terai has declined recently because of the shortage of free and cheap land in the adjacent plains.

Furthermore, factors such as malaria eradication, irrigation facilities, the extension of roads, the relocation of district headquarters and market centres to the valleys, and the retaining of the land on the ridges, together with the population's growing confidence in local development after the 1991 political change in the country, encouraged the hill migrants to permanently settle to farmlands in the valleys (Tiwari, 1996).

One of the determinants of in-migration to Kathmandu may be the dissolving of the long established trade between Nepal and Tibet (which has been going on since the twelfth century A.D.) that began in 1959 after China's invasion of the latter (Bishop, 1990)[9]. As a result, many mountain traders including Manangis (people from Manang) and the Sherpas started to migrate to Kathmandu. The purpose of their settling in Kathmandu is for trade for international goods, mainly imported merchandise from Hong Kong and Bangkok.



Source: Census Bureau of Statistics, Nepal

Figure 8.2

Migration Trends and Characteristics of the Migrants

In the past, the lack of able-bodied males from the hills, an outcome of the recruitment of Gurkha soldiers to the British and Indian Army, was blamed for the declining production and the deteriorating hill economy (Kansakar, 1979; Conway and Shrestha, 1981). However, others believe that the recruitment strengthened Nepal's economy by bringing in millions in foreign currency in the form of salaries and pensions (Weiner, 1973; Gaige, 1975; Tiwari, 1996; Gurung, 1998). Currently, the situation has changed, with the Gurkha recruitment reduced drastically. This has affected the hill economy on the one hand and food deficiency due to population pressure, on the other, compelling people from the hills to out-migrate elsewhere, especially to the Terai.

However, in the late 1960s, Gaige found that the majority of the migrants in the Terai were not comprised of a population mainly of hill origin. His survey showed that 59 percent of the migrants were of plains origin, 35 percent of hills origin, and the remaining 6 percent of tribals indigenous to the Terai. Most of the migrants from the hills belonged to the high-caste, whereas the majority of "plains migrants" belonged to the low-caste. By 1991, the majority of migrants into the Terai were from the adjoining hills, followed by those from other parts of the hills, migrants from other parts of the Terai being the lowest in number (Table 8.1).

In the western hills, migrant households were found to be more involved in agriculture and salaried employment than in other occupations. Migrants are also found to be more educated than the native settlers. The ethnic characteristics of the migrants show that the so-called high-caste Brahmins and Chhetris and low-caste Kami (a socially disadvantaged group) move around in larger proportions than the average, followed by the Magars and the Newars. Gurungs are the least mobile group in rural-to-rural migration preferring to move to urban areas[10]. Social oppression and poverty did not prove to be the major "push" factors in these areas. Rather, the socio-economically weak segments of the population were found to be the least migratory type (Tiwari, 1996), which is in line with Myrdal's (1968) view. Among other characteristics, young population were likely to migrate more often than the old. However, unlike Ravenstein's famous law "females are more migratory than males" (as cited in Lee, 1966), the opposite case was found in all the regions in Nepal, males predominating over females (Gurung, 1989).

Table 8.1

Origin of Migrants to the Terai, Nepal, 1991

	Adjoining hill region	Other hill region	Other Terai region	Other region	Total
Number	707,935	187,953	93,625	121,826	1,111,339
%	63.7	16.9	8.4	11.0	100.0

Source: Harka Gurung, Nepal Social Demography and Expressions, 1998.

Determinants of Internal Migration in Nepal

Among the determinants of migration in Nepal, population pressure in the hills since 1961 has been considered the major factor (Weiner, 1973; Gaige, 1975; Conway & Shrestha, 1981; Shrestha, 1982; Gurung, 1989; Seddon, 1995; Gurung, 1998). The major cause of population growth in Nepal is the steady decline in death rates (crude death rate decreased from 36.6 per 1000 population in the 1950s to 1.3 in 1991) and almost unchanged birth rates (crude birth rate was 45 per 1000 population in the 1950s and 41.6 in 1991) (Central Bureau of Statistics, 1995). Until the 1970s, nearly two-thirds of the population lived in the hills and the mountains (Table 8.2). Although a massive migration has been taking place from the hills to the Terai, about half of the current population still live in the highlands (Gurung, 1998).

People seem to migrate towards the less dense areas both in the hills and the Terai (Gaige, 1975). Until the 1970s, the majority of internal migration took place from one hill district to the other, mainly from the west to the east (Weiner, 1973; Gaige, 1975). During the 1950s and the 1960s, many Magars and Gurungs of the western hills of Nepal left their ancestral villages and migrated into the less densely populated and the less dry eastern hills.

Table 8.2

Percentage Distribution of Population by Ecological Regions, Nepal, 1971-1991

Region	Percentage of Population		
	1971	1981	1991
Mountain	9.9	8.7	7.8
Hill	52.5	47.7	45.5
Terai	37.6	43.6	46.7
Total Population ('000)	11,556	15,023	18,491

Source: Population Monograph of Nepal, Central Bureau of Statistics, Nepal, 1995.

The decline in agricultural productivity, and the erosion and famine, were the main determinants that pushed the western hills people farther and farther to the east (Gaige, 1975). In later years, increasing population pressure led the hills people towards south, the Terai[11]. Contrary to the pattern of migration in the hills, migration within the Terai was found to take place from the east to the west. The increasing household size, the marginal landholdings, the adverse physical conditions, and the scarce non-farm employment opportunities were cited as the leading determinants of out-migration of farmers in the Upper Pokhara Valley of the West Nepal (Thapa, 1993). In some Terai areas, people moved from crowded southern villages to the newly established villages farther north (Gaige, 1975).

In contrast to the assumption that the high incidence of temporary migration of people from the hills to seek employment elsewhere is due to food shortage, Poffenberger (1980) argues that with poor economic conditions, people may continue to migrate even when food shortages do not exist. Because of very limited cash generation in the hills, people could not spend money on essentials such as the cloth, kerosene, salt, sugar, and metal-ware, most of which are imported from India[12]. Borrowing cash is the only means that the Nepalese hill peasants have for occasions such as weddings, death rituals, and other cultural ceremonies. Although the "push" factors such as the deteriorating economic conditions due to the population pressure and deteriorating environment experienced by almost all areas in the hills are similar, it is difficult to determine why the volume of migration vary significantly from district to district (Rana and Thapa, 1975). Poffenberger explains that those districts that had easier access to economic opportunities, for example, the districts surrounding the Kathmandu Valley, had only half of the volume of migrants than other districts in the 1961 census data.

In general, agriculture was the main reason for migration (for 29.9% migrants) in 1981 census, the major reasons varied in different regions. A desire for trade and commerce was the leading reason for the mountain migrants, agriculture for the hill migrants, and marital relationships for the Terai migrants (Table 8.3). Migrants are also found to switch their occupations in the destination areas. One recent study by Subedi (1997) found that, although most people (more than 50 percent) involved in agriculture, service[13], business and trade, and wage labour in both agricultural and non-agricultural fields continued their respective occupations, almost half of them changed their occupations later. People in business and trade (71 percent of them) were the ones who were more attached to their occupations that had originated in their place of origin compared to others. Those migrants who often changed their occupations to various fields came from the 'cottage industry,' the 'domestic works,' and the 'students' categories (Subedi, 1997: 169).

Conway and Shrestha's (1981) study showed that the highest percentage of the hill migrants to the Terai, some 31 percent, gave the reason for their migration as the low production in the hills, which was insufficient to support their families. Reasons such as "hope to get land elsewhere," "availability of more productive land elsewhere," "difficult terrain and landslides here" followed respectively. Only 1.4 percent of migrants gave "better education and transportation" as reasons for leaving their ancestral homes. Among the absentees in the hills, 36 percent were involved in military service (overseas and at home), followed by those in "non-manual work" (28.5%), and manual labouring

(15.7%), with only 3 percent being away for studying. Surprisingly, only a low percentage (3.6%) of the migrants were involved in agricultural work.

Table 8.3

Reasons for Inter-Regional Migration, Nepal, 1981

	Mountain		Hill		Terai		Total	
Reasons	No.	%	No.	%	No.	%	No.	%
Agriculture	58,859	18.7	237,733	37.3	14,293	16.4	310,885	29.9
Trade and commerce	103,736	32.9	36,733	5.8	10,606	12.2	151,075	14.5
Marital cause	22,765	7.2	80,065	12.6	18,085	20.8	120,915	11.6
Service	7,041	2.2	30,329	4.8	5,246	6.0	42,616	4.1
Study/ Training	7,397	2.3	20,232	3.2	2,239	2.7	29,868	2.9
Others/ unstated	115,297	36.6	231,546	36.4	36,660	42.1	383,503	36.9
Total	315,096	100	636,638	100	87,129	100	1,038,862	100

Source: Central Bureau of Statistics, Vol. II, Table 9, 1984.

Hypotheses

Because of the return of Nepalese soldiers from the Second World War, the improvement in mortality, high persisting fertility, and the reduced recruitment of Gurkha soldiers in the British Army in the last quarter of the 20th century, heavy population pressure occurred in the hill region of Nepal. In addition, the return of Nepalese residing in countries such as India, Burma, and Malaysia after the Second World War as a result of political changes in those countries was also accountable to the population pressure in Nepal. The land inheritance system of the country, in which fathers' lands and houses are equally divided among the sons (in most ethnic groups) is restricting the amount of land inherited. In combination, these situations have pushed the hill people to the lowlands, especially to the south flatland Terai region, where agricultural and other economic opportunities have been booming. Otherwise, until the 1970s, rural people migrated mostly to the other rural areas seeking a better life (Shrestha, 1982). With this background, it becomes important to estimate the volume and rate of net migration in order to have a better idea of likely change in regional population in specific age groups, which will help formulate a practical and more focussed population policy.

The Nepal case is similar to the one faced by European countries, especially Ireland, between the late nineteenth century and the mid-1950s, and by Japan in the mid-1950s. In the early 1960s, Kingsley Davis postulated the "Theory of Multiphasic Response" based on the experiences of these two countries. His thesis was that with a persistently high rate of natural increase in the rural areas resulting from sustained mortality declines, people used every demographic means possible (one of them being migration) to reduce population pressure. Ireland, an agrarian Catholic country, relied mainly on migration and celibacy (Davis, 2002). In the mid-1950s, similar to the Irish reaction, the Japanese chose migration as one of the means to check the high natural increase, but unlike the case of Ireland, other responses occurred, including postponed marriages and increased use of contraception, sterilisation, and abortion.

As mentioned earlier, Nepal's population problem in the hills and its recent migration history seem to fit Davis's "Multi-phasic Response" theory. Hence, one may hypothesise (we will call it the "Population Pressure Hypothesis") that the highland people of Nepal were motivated to migrate to the lowlands and, subsequently, to towns and cities as a means to attain economic stability in the face of population pressure in the hills.

From past European experience, social scientists have noted that migration was age-selective, young people tended to migrate more than the elderly whether for job opportunities, higher education, or other economic reasons. Petersen's (1969) typology of migration suggests that young males and females predominate in the migration to rural and to urban areas. Bogue (1969) found that mobility reaches a maximum during young adulthood. As mentioned earlier, most migrants in Nepal were found to be young by previous studies (Gurung, 1989). Myrdal (1957) believes that the age selective nature of migration (e.g. young people, better-educated, and highly productive people migrating more often) contributes to economic growth and labour demand in the area of destination while decreases growth and demand in sending areas. According to Myrdal, such consequences of migration result in further disparities in the socio-economic conditions of the two areas, encouraging remaining people in the area of origin to migrate, thus creating a circular and cumulative causation (Myrdal, 1957 as cited in Massey, 1990). In addition, this age selective nature of internal migration may have a significant impact on future size and age distribution of the population of both the areas of origin and destination. This may be applicable to Nepal's situation as well. It is, hence, hypothesised that young Nepalese adults will show greater propensities to migrate than those in other age groups.

Methodology

This study concerns about the regional differentials and the age-specific differentials in internal migration in Nepal. Nepal is divided into three geographical regions: the mountains, the hills, and the Terai (from north to south respectively). The volume of net migration and the rates of migration were computed by age groups for all three regions to study the differentials. The data used were from the 1981 and 1991 censuses of Nepal conducted by the Central Bureau of Statistics, Kathmandu, Nepal. Nepal lacks a proper registration system, making it difficult to obtain accurate measures of net movement. In the analysis section, assuming that younger children accompany their migrating parents, the age group (0-9) was not included.

Computation of Net Internal Migration

The net internal migration is estimated as the difference between the enumerated population in the second census and the expected population. The Forward Census Survival Ratio (FCSR) was used to estimate the net migration. This method is useful for developing countries in which vital statistics are not available. Moreover, it does not need life-table values and has the advantage of eliminating the effects of some of the errors in the population statistics (Shryock et al., 1976). The following equation was used to compute net internal migration for various age groups and regions:

$M_i = P_{i,(2)} - SP_{i,(1)}$, where

M_i = age-specific net internal migration for different regions, 'i' standing for the mountains or the hills or the Terai,

$S = P_{(2)} / P_{(1)}$ = age-specific survival ratio, based on national age-specific populations at t_2 and t_1 (t_2 being 1991 and t_1 being 1981 in this case)

$P_{i,(1)}$ = population of a particular age in region "i" in the previous census,

$P_{i,(2)}$ = population of a particular age in region in the later census,

$P_{(1)}$ = age-specific mid-year population of Nepal in the previous census,

$P_{(2)}$ = age-specific mid-year population of Nepal in the later census.

Net Migration Rate is then computed as:

$m_i = (M_i/P_i)k$, where

m_i = the net migration rate for a given age group and region between 1981 and 1991,

M_i = the estimated number of net migrants for a given age group and region 'i' during the 10 year period,

P_i = the age-specific population likely to migrate during the interval,

$k = 1000$.

The above notations and equations were followed for all three regions, with 'i' representing the 'mountains,' the 'hills,' and the 'Terai.' The age-specific values of M_i and then m_i were also computed for each age group within each region. Methods based on certain assumptions were used to estimate net internal migration for each region because the age-specific populations of the regions were not available for both the census years 1981 and 1991. Thus, the proportion of population in every age group for the country as a whole was computed first. Then assuming that the same proportion of people exist in the regions for every age group, the population for each group was computed by multiplying the region's (total) population by the proportion of the age group for each year.

Limitations

There are some limitations to this method based on the assumptions: (a) the national population is closed; that is, it is not affected by external migration, (b) the specific mortality rates are the same for all the regions as those for the country, (c) the ratio of the degree of "completeness" of enumeration in any age group in the region to that of Nepal is the same for the same cohort in both the censuses. In addition, it should be noted that the Forward Census Survival Method yields an estimate of net migration only for survivors of the initial age cohort. If the number of deaths to in-migrants differs from the number of deaths to out-migrants, the estimated net migration will differ from the true amount (United Nations, Manual VI, 1970). Moreover, the assumption that all of those in the previous census survive until the next census is another limitation.

Findings

The results from Table 8.4 show that the region "mountain" lost population in all the age groups during 1981 and 1991. The age group 10-19 experienced an out-migration of 25,800 people. The number of out-migrants decreased as the age group increased. In other words, young people under age 40 moved out to other regions more than those over 40. The rate of out-migration was very high in the mountains, particularly in the age group (10-19) at 98 per 1000 population[14]. The rate decreased as the level of the age group increased. However, the net migration rates for age groups 40-49 and 50-59 did not show a great differential.

Table 8.5 presents net out-migration from hill regions. In total, 191,000 persons out-migrated from the hills during 1981 and 1991. Most of them might have moved to the Terai. Among the migrants, 63,900 were in the younger age group, 10-19. A substantial number of the hill people in the age groups 20-29 and 30-39 also left the hills to live elsewhere. The number of out-migrants decreased as age increased[15]. The rate of out-migration from the hills was moderately high, ranging from 44 to 31 out-migrants per 1000 population. The rate decreased with an increase in age. Nevertheless, the decrease was relatively marginal.

The net migration shown in Table 8.6 depicts that the Terai region had a net gain in all age groups during the ten-year period. The net gain was highest for the age group 10-19, which decreased with age. It is clear then that the Terai gained people from the other two regions. The total net increase in population for all age groups together was as high as 266,500[16].

Table 8.4: Expected Population and Net Internal Migration of Mountains, Nepal, 1991.

Age group ('000) (1981)	Population of Nepal, 1981 census ('000) (P_{81})	Population of mountains, 1981 ('000) (P_{M1})	Age group (1991)	Population of Nepal, 1991 census ('000) (P_{91})	Population of mountains, 1991 ('000) (P_{M2})	Forward Census Survival Ratio (FCSR) P_{91}/P_{81} (S)	Expected population of mountains, 1991 $S*P_{M1}$ (P_{P1})	Estimated net internal migration in mountains, 1991 ('000) $(P_{M2} - P_{P1})$	Rate of net migration (per 1000), mountains, 1991 $(P_{M2} - P_{P1})/(P_{M1})$ (m_m)
10-19	3035	263.2	20-29	2961	231.0	.9756	256.8	-25.8	-98.0
20-29	2497	216.5	30-39	2181	170.1	.8734	189.1	-19.0	-87.8
30-39	1869	162.1	40-49	1577	123.1	.8438	136.8	-13.7	-84.5
40-49	1372	119.0	50-59	1064	83.0	.7755	92.3	-9.3	-78.1
50-59	888	77.0	60-69	702	54.8	.7905	60.9	-6.1	-79.2
60-69	555	48.1	70-79	369	28.7	.6649	32.0	-3.3	-68.6
Total								-77.2	

Note: Computed from Nepal census data, 1981 and 1991.

Table 8.5: Expected Population and Net Internal Migration of Hills, Nepal, 1991.

Age group (1981)	Population of Nepal, 1981 census ('000) (P_{81})	Population of hills, 1981 ('000) (P_{H1})	Age group (1991)	Population of Nepal, 1991 census ('000) (P_{91})	Population of hills, 1991 ('000) (P_{H2})	Forward Census Survival Ratio (FCSR) P_{91}/P_{81} (S)	Expected population of hills, 1991 $S*P_{H1}$ (P_{P2})	Estimated net internal migration in hills, 1991 ('000) ($P_{H2} - P_{P2}$)	Rate of net migration (per 1000), hills, 1991 $(P_{H2} - P_{P2})/(P_{H1})$ (m_h)
10-19	3035	1446.9	20-29	2961	1347.7	.9756	1411.6	-63.9	-44.2
20-29	2497	1190.5	30-39	2181	992.5	.8734	1039.8	-47.3	-39.7
30-39	1869	891.1	40-49	1577	718.1	.8438	751.9	-33.8	-37.9
40-49	1372	654.0	50-59	1064	484.0	.7755	507.2	-23.2	-35.5
50-59	888	423.3	60-69	702	319.9	.7905	334.6	-14.7	-34.7
60-69	555	264.3	70-79	369	167.5	.6649	175.7	-8.2	-31.0
Total								-191.1	

Note: Computed from Nepal census data, 1981 and 1991.

Table 8.6: Expected Population and Net Internal Migration of the Terai, Nepal, 1991.

	Population of Nepal, 1981 census	Population of Terai, 1981		Population of Nepal, 1991 census	Population of Terai, 1991	Forward Census Survival Ratio (FCSR)	Expected population of Terai, 1991	Estimated net internal migration in Terai, 1991	Rate of net migration (per 1000), Terai, 1991
Age group	('000)	('000)	Age group	('000)	('000)	P_{91} / P_{81}	$S{*}P_{T1}$	('000)	$(P_{T2} - P_{P3})/(P_{T1})$
(1981)	(P_{81})	(P_{T1})	(1991)	(P_{91})	(P_{T2})	(S)	(P_{P3})	($P_{T2} - P_{P3}$)	(m_t)
10-19	3035	1324.5	20-29	2961	1381.3	.9756	1292.2	89.1	67.3
20-29	2497	1089.8	30-39	2181	1017.2	.8734	951.8	65.4	60.0
30-39	1869	815.7	40-49	1577	736.0	.8438	688.3	47.7	58.5
40-49	1372	598.6	50-59	1064	496.1	.7755	464.2	31.9	53.3
50-59	888	387.5	60-69	702	327.9	.7905	306.3	21.6	55.7
60-69	555	242.0	70-79	369	171.7	.6649	160.9	10.8	44.6
Total								266.5	

Note: Computed from Nepal census data, 1981 and 1991.

The rate of in-migration in the Terai was substantially high, ranging from 67.3 for the youngest age group to 44.6 per 1000 for the 60-69 age group. As opposed to the other two regions where rates decreased with an increase in the age group level, a higher rate of migration (55.7 per 1000) was noticed for people in the age group 50-59 than for the 40-49 age groups (53.3 per 1000). The older people migrated to the Terai, most probably, to join their family members who had migrated to that region earlier[17]. The estimated trend in the volume of migration is in line with the national figures of in-migration and out-migration given in Tables 8.7 and 8.8.

Table 8.7

In-Migrants by Region, Nepal, 1981-1991

Region	1981		1991	
	Number	%	Number	%
Mountain	53,628	5.2	39,751	2.8
Hill	211,927	20.4	267,116	18.8
Terai	773,307	74.4	1,111,3398	78.4
Total	1,038,862	100.0	1,418,206	100.0

Source: Harka Gurung, Nepal Social Demography and Expressions, 1998.

Table 8.8

Out-Migrants by Region, Nepal, 1981-1991

Region	1981		1991	
	Number	%	Number	%
Mountain	315,095	30.3	201,406	14.2
Hill	636,638	61.3	1,021,039	72.0
Terai	87,129	8.4	195,761	13.8
Total	1,038,862	100.0	1,418,206	100.0

Source: Harka Gurung, Nepal Social Demography and Expressions, 1998.

Discussion

The findings show that the people from the mountains and the hills migrated to the Terai in large numbers during 1981 and 1991. Nepal's internal migration experience agrees with the theory of "Multi-phasic Response" as a consequence of high natural increase put forward by Davis some decades ago (Davis, 2002). In the beginning, people experienced population pressure in the highlands because of the improved mortality and the persisting high fertility, and then they were motivated to move elsewhere, especially to the Terai, for economic stability and, possibly, to control their family size. The findings of this chapter fully support the "population pressure" hypothesis.

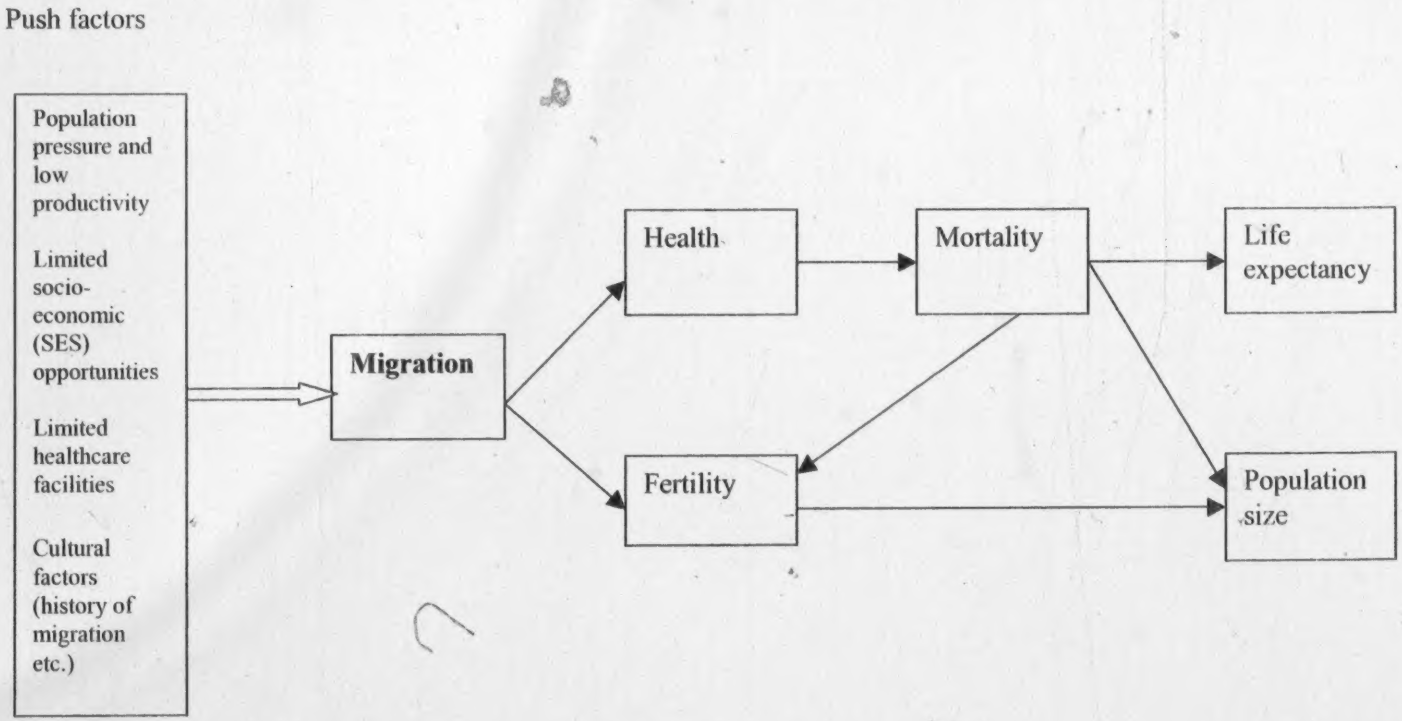
Among the migrants, as hypothesised, the younger age groups were more mobile than the older age groups, the youngest age group (10-19) being in the top list. The high mobility of the youngest group could be explained by several facts. First, children and young teenagers accompany their parents when they move out. Second, adolescents in their late teens most often move to the lowlands for better and further education as well as for jobs. Third, the younger population in the age group (10-19) become adults at one point or the other within the ten-year period, and parents normally force adult children, especially men, to get married once they are over age 20; and before getting married and/or being independent, most men want to stand on their feet first, and thus, they may seek jobs elsewhere[18]. Fourth, aside from joining the Indian and the British armies, young adults have recently begun to pursue higher studies and salaried jobs in foreign countries. Moreover, girls who are sent off in marriages to other places (including the lowlands) also happen to be in this age group.

The rates of net migration show a similar trend, except for the age groups 40-49 and 50-59 in the Terai group. The rates of net migration are the highest for the mountain region in every age group followed by that of the Terai, the hills having relatively moderate rates. This indicates that the mountains drained their population faster than the hills, implying a faster population loss in the future. The hill region is losing more people but at a slower pace than in the mountains, indicating that a longer time will be needed for the hills to lower their population pressure. In fact, the volume and rate of out-migration in the hills could have been higher, had Kathmandu Valley not included in the hill region. The Terai's net gain is high because the net flow is from both the highland regions. This suggests that the Terai is facing rapid population growth.

Because of the in-migration of the young population, the whole population structure of the Terai is bound to change in the near future. Since these migrants are in prime age of reproduction, the population of the Terai will grow rapidly, and thus the age distribution will change drastically, dominated by a young and dependent population. In such situations, resources may have to be increased in the areas such as day cares, schools, and health care facilities, which may become a big challenge for a poor country such as Nepal. Also, another possibility is that because of better health care facilities, good food, and new freedoms (as opposed to the traditional cultures in the place of origin), the fertility level of the migrant population may increase in the initial stage of migration, except for those who migrate to Kathmandu, where living expenses are very high and fertility is low[19]. Similarly, because of the improved economy and better health in the area of destination, mortality may decline, resulting in increased life expectancy as well as population size. Consequently, couples may want fewer children because of improved child survival. This may have a great impact on the size of the population in the areas of destination[20].

On the other hand, because of the high density of population and pollution in the area of destination, infectious diseases may rise and also, the overall health of people may deteriorate. This may increase mortality, consequently, lowering life expectancy and population size. Again, because infants and children are more vulnerable to infectious diseases and mortality related to such diseases, couples may want to produce more children for fear of losing some of them. Population may increase in such situations. This indirect dual effect of migration is clear from the framework presented below (Figure 8.3).

Figure 8.3: Summary of Factors Affecting Population Size and Life Expectancy Mediated by Internal Migration in Nepal


Push factors
Population pressure and low productivity
Limited socio-economic (SES) opportunities
Limited healthcare facilities
Cultural factors (history of migration etc.)
Migration
Health
Fertility
Mortality
Life expectancy
Population size

As mentioned earlier, migration is shown as having indirect effects on life expectancy and population size through its effects on health, fertility, and mortality. This framework is in line with Zelinsky's (1979) earlier theory, according to which Nepal seems to be in the second phase of mobility transition, which he called "the early transitional society" phase. Among the characteristics of such societies, "massive movement from countryside to cities" and "significant growth in various kinds of circulation" fit into Nepal's movement pattern. His idea of mobility transition arose from the fact that historical demographic transitions did not include migration as one of the components that affect demographic transition. Migration's role in demographic transition may be indirect yet important.

Apart from the consequences discussed above as indicated by the framework, there are other consequences, mostly unfavourable, which affect Nepal's modernisation process. They are discussed below.

Adverse Consequences

Economic consequences

Nepal may have to face many challenges and consequences because of the young population's moving from the highlands to the lowlands. Among other things, the mountains and the hills may experience a severe lack of manpower, which will affect their agricultural production, ecosystems, the health status of the remaining population (those who do not migrate) and thus the economy of these places. There will be more dependants left in the highlands, and the preservation of these areas may become impossible.

One of the other adverse consequences may be that in the long run, unemployment problems may become acute for the young people in the area of destination, the Terai. Moreover, the illegal trafficking of young girls from specific hill areas of the country to Indian cities is on the rise (Zielenziger, 2001). The young unemployed girls in the over-populated Terai may be victims of trafficking as access to the cities across the border becomes easily available.

Nepal has been facing a huge financial loss because of its internal migration flow into the Terai. In 1967, about 40 percent of the entire Terai was forested (Gaige, 1975). As in the early nineteenth century, commercial timber still remained a source of revenue for the government during the post-1951 period (Gaige, 1975; Ghimire, 1992). But during the government's resettlement programme in the 1960s and the 1970s, migrants began encroaching into the Terai by clearing the dense forests. Such deforestation reduced the country's timber resources as well as increased soil erosion and flooding (Weiner, 1973). Because of reduced timber export, the Nepalese government has lost a significant amount of foreign exchange revenue.

Political consequences

In previous studies, most of the migrants were found to be skilled, which means that the hills have lost not only the manpower but also innovative ideas and the creativeness of the youth. In the area of destination, however, the situation may be very different. By virtue of the migrants being skilled, young, and from better-off and influential backgrounds, they may pose a challenge to the local people. The tension between the people of the "Terai origin" and the hill migrants has already been felt in most parts of the Terai. The political conflict between the two groups became obvious in 1991 when the Nepal Sadbhavana Council (an organisation of the Terai people of Indian origin) was converted into an overt political organisation, the "Nepal Sadbhavana Party" in 1990 to represent the interests of the Terai people of Indian origin in the new democratic government (Gurung, 1998).

The major demands of the party included a liberal policy on citizenship for new immigrants (from India), official status for the Hindi language, employment quotas for the *Madhise* (people of Terai origin) in the civil service and the army, and a federal system of government, all of which are expressions of regionalism based on the demand of separate identity for Terai lowlands (Gurung, 1998). These kinds of reactions are indeed natural from people who have been settled in the Terai for nine to thirteen generations (Gaige, 1975) and who are now facing the increasing influence of the "hill origin" people in the Terai constituencies (Gurung, 1998). Until 1961, only about 30 percent of Nepal's population lived in the Terai. At that time the Terai was occupied almost exclusively by people of plains origin (Weiner, 1973). People of hill origin now constitute 30.9 percent of the Terai's population (Gurung, 1998).

Health-related consequences

Another adverse consequence of heavy migration into the Terai may be a possible increase in uncontrollable malaria. In the early 1970s, after malaria was almost eradicated from the Terai, anti-malarial drug resistant germs were found and malaria slowly returned to Nepal as it did in many other parts of the world, although not to the earlier extent. Also, as the Terai becomes overpopulated, pollution is bound to increase.

Over population also means that the already hot and humid Terai's temperature will continue to rise. In such situations, the population of mosquitoes will increase, spreading malaria. Moreover, because of heat, pollution, and inadequate health care facilities, there may also be a high chance of spreading other infectious diseases.

Other consequences

A change in internal migration trends has been noticed during the mid-1980s and the mid-1990s. People seem to prefer valleys as their destinations to the Terai plains (Tiwari, 1996). Among other valleys, the attraction to Kathmandu Valley (being the capital city) seems to be strong as a result of the potential for non-agricultural employment in various fields, higher education, jobs in national and international non-profit organisations and the political organisations, as well as its modern facilities. One of the reasons for selecting Kathmandu as a destination, despite its high cost of living, may be that people are more educated now than in the past, and thus seeking higher education and better employment may have become a norm.

Indeed, the flow of migration has changed in the recent years. In 1971, the flow was mainly downward from the hills to the Terai (Figure 8.2). Although people are still moving to the Terai, the flow has also shifted to the Kathmandu Valley (Figure 8.4). In addition, people are also migrating towards the eastern mountains from the eastern lowlands and the hills, most probably because of the tourism and the mountain development programmes. This particular flow (Figure 8.4) is seen exclusively in the eastern parts of the country as these areas house the World's five highest mountains including Mount Everest (or Mt. Sagarmatha). On the other hand, the migration is very low in the western part of the country, with virtually no migration from and to the mountains. The reasons for the low movement, perhaps, are the remoteness of the western hills and mountains, and also the fact that it is the least developed region in the country (Figure 8.4).

Keeping in view of the recent shift of the migration flow from the Terai plains to the valleys, especially to the Kathmandu Valley, a number of other consequences need to be considered. First and foremost, Kathmandu is already over-populated and polluted. A shortage of water has been a problem since the early 1990s and "load shedding" (shutting off electricity at specific time and days) at times has become a routine since that time. In addition, Kathmandu has been a place of attraction not only for the highlanders but also for the permanent migrants from the Terai, for seasonal and the permanent immigrants from across the south border, and for international agencies. One of the unfavourable results of such attractions is the increase of slums in the Kathmandu Valley. A rare sight until the 1960s and 1970s, squatter settlements reached 39 in number with about 6000 people living along the Bagmati and the Vishnumati rivers (K. C., 1995). Most slum and squatter settlers come from the nearby hills, some belong to the "Sukumbasi" status (those who do not have their own land and house) and others come from across the south border as seasonal migrants.

Regional Migration in Nepal, 1991

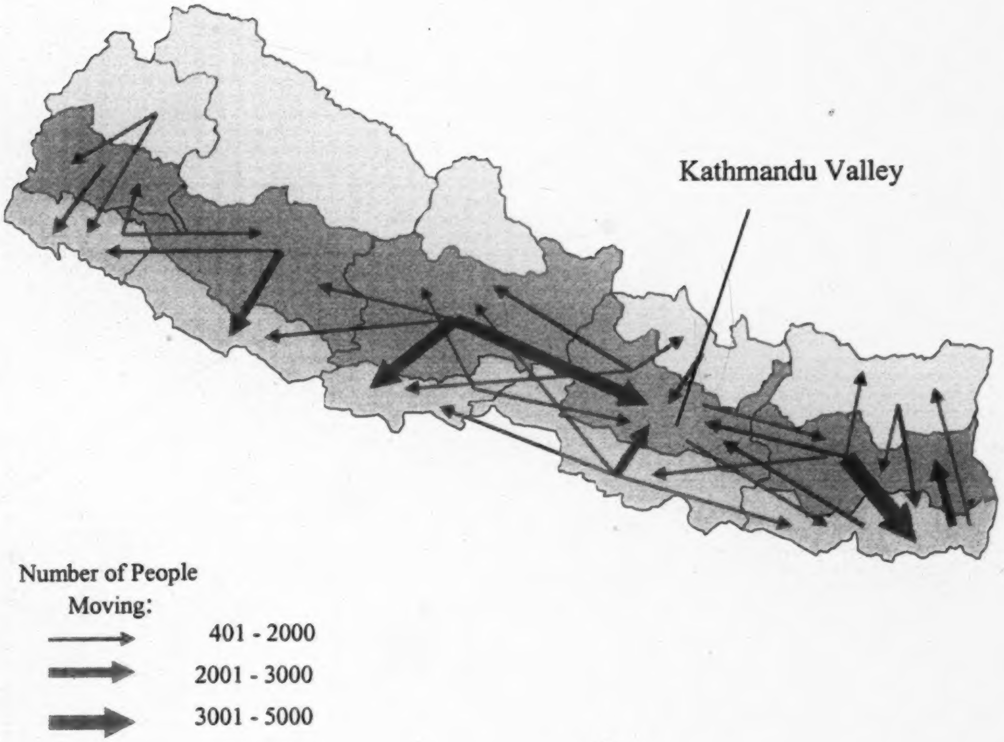


Figure 8.4

Source: Dr. Mohan N. Shrestha, Bowling Green State University, USA

High inflation, temperature increase, and a threat of infectious diseases are only some of the adverse consequences that the people of Kathmandu face every day as a result of over-population and pollution, and they will likely continue to face such problems with greater intensity in the future. Recently, UNESCO has added the Kathmandu Valley in its list of "World Heritage Sites in Danger" (Kathmandu in UNESCO's endangered list, 2003). The alarming population growth and the population densities of both the Terai and Kathmandu are clearly seen in Table 8.9. Nevertheless, there are some advantageous consequences of internal migration in Nepal: interaction and sharing of different cultures, economic stability for families, and access to modern facilities. In the absence of desirable data on migration, the above discussion sounds speculative, however.

Table 8.9

Population Growth Rate and Density by Ecological Regions,
Nepal, 1981-1991

Region	Annual growth rate (%)	Population density (population per sq Km.) 1981	1991
Mountain	1.02	25.1	27.8
Hill	1.61	116.7	137.3
Terai	2.75	192.7	253.6
Total (Nepal)	2.08	102.0	125.6
Kathmandu Valley	3.48	863.5	1,229.6
Kathmandu	4.70	1079.2	1,709.7
Lalitpur	3.32	578.6	668.4
Baktapur	0.79	1213.6	1,453.4

Source: Population Monograph of Nepal, Central Bureau of Statistics, Nepal, 1995.

Conclusion

It has been one of the most firmly established generalisations in demography that young adults predominate in the migration process (Petersen, 1969). Nepal is no exception. The younger population is migrating from one region to another, the majority of them moving from the hills to the Terai plains. People out-migrating for reasons such as "high natural increase" is not a new phenomenon. The European and the Japanese experiences in the past demonstrate similar stories. The population pressure in the hills of Nepal has played an important role in its migration patterns. In fact, the population pressure and the low production in the hills were such that it seemed as though the highland people were simply waiting for the malaria eradication campaign in the Terai to take effect and for a means (highways joining the North and South) that would open the door to the lowlands. Because Nepal's internal migration is mainly motivated economically, migration from the mountains and the hills to the Terai and the valleys is likely to continue. With increased levels of education, higher aspirations of the people, and the interactions of Nepalese people with people from around the world through popular media and personal contact, the flow of migration to the cities will likely intensify in the future[21].

The government of Nepal and its planners will likely have to attempt to deal with irreparable damage to the country once the capacity of the Terai and other cities including Kathmandu to accept more migrants is reached in the near future. And by then it may be too late to solve the population and the migration problems. Population regulation, with a low fertility, possibly to a replacement level, seems to be an important mechanism to resolve the internal migration problem in Nepal.

Another important mechanism could be to intensify the rural development. While it is valid in today's population redistribution situation (with the Terai gaining population rapidly) that "the heavy concentration of effort and resources in rural development in the hills and mountains may have to be re-evaluated in the face of the changing distribution of population" (Goldstein at al., 1983: 64), it is more important now than ever to emphasize development in the rural hills and mountains to attract people or at least to reduce the flow of the remaining population to the Terai. There should, at least, be plans in the rural hill and mountain areas for some space and work when the Terai, in particular, loses its capacity to open its arms to outsiders. Since 1988, the Terai has an additional problem of providing shelter to more than a hundred thousand Bhutanese refugees of Nepalese origin, who were expelled from Bhutan (Karan and Ishii, 1996; History of the Bhutanese refugees, 1996).

As observed by a number of native and foreign researchers (Justice, 1986; Stone, 1986; Tiwari, 1996), most of the important government administrative offices and private enterprises are located in cities and towns in Nepal. Except for the teaching, all other employment opportunities (positions) in the rural health centres, the development offices (Agricultural Development Bank, etc.), the police stations, and other government and non-government organisations are filled by outsiders (mostly by urban people). Either outsiders find these jobs through influential relatives or they are qualified for the particular positions. Even though Tiwari (1996) acknowledged the above observation, he also noted that no substantial attempts to establish basic infrastructures and to provide services had been made to bring jobs to rural people. The effort of the government in rural development does not meet the needs of rural areas. Nevertheless, the observations made by these researchers also indicate that it is not the non-farm job opportunities that are lacking but either qualified manpower or proper bureaucratic management that is deficient in these areas. On the one hand, able youngsters are migrating elsewhere out of the rural hills, and on the other, the government needs to hire outsiders for non-farm salaried jobs in the hills. Furthermore, while the urban personnel designated to rural posts are often found to be unwilling to work in rural settings, rural people are reluctant to seek help from the sophisticated and the so-called high caste city personnel (Justice, 1986; Sigdel, 1998). Efforts to train local men and women for particular jobs may be one strategy to keep the young generations in their highland homes and, thus, eliminate the conflict between the local people and the outsiders. To solve such a dual problem, mechanisms have to be developed through the combined efforts of both the government and the local highland people.

Infrastructure such as health care facilities, schools, roads, irrigation facilities, electricity, and the like are not adequate in rural areas, another cause that drive people away from their ancestral homes. As explained by Harvey and Riddel (1975) in the case of other developing countries, it seems that for a least developed country such as Nepal, the study of migration should essentially be part of the analysis of the general modernisation process and that changes in the geographic structure seem to be intimately related to behavioural change. Unless the population control programme, along with other development plans, is intensified in both the hills and the plains of Nepal, neither the National Wildlife Conservation Parks nor the tourism development programmes will provide enough employment opportunities for the growing population in the hills nor the "pressure releasing" Terai area and the "land of opportunities" Kathmandu will hold the future generations.

As seen from the framework presented earlier, it is clear how the lack of socio-economic, health-related, and material-related modernisation factors is affecting people's lives and, thus, pushing them away from their highland homes. On the other hand, the availability of these same factors is attracting them to the Terai and the cities. Also, because of the ancestral tradition of migration, some families are motivated to send young people elsewhere for salaried jobs.

The framework (Figure 8.3) also unveils how migration affects Nepal's life expectancy and population size through fertility and improved health and, consequently, through mortality. As discussed, migration has adverse as well as useful effects on Nepal's population. Even though migration need not be the only mechanism to release the population pressure of the hills, the negative along with the positive consequences of migration should be considered while formulating population policies for the country. What the policy makers should keep in mind is that in the process of the demographic and epidemiological transitions of Nepal, migration is certainly playing a significant role.

Endnotes

1. See Harvey and Riddell (1975) for further study on developing countries.

2. The Terai is the flatland of Nepal, which is located in the south strip along the border of India.

3. Rana is the title of the autocratic Nepalese government's Prime-Ministers. The Ranas extended the hereditary Prime-Ministership among the brothers and their generations. This autocratic regime lasted for 104 years until 1951.

4. The unequal distribution of land, consequently, a handful of people becoming rich landlords while millions of people remaining landless are also an outcome of the Rana's land grant system that extended to various members of the Rana families (Bajracharya, 1983). The fact that when the Rana regime was overthrown in 1951, about one-fourth of the total cultivated area in the kingdom belonged to members of the Rana families (Regmi, 1978) supports the above theory.

5. Brahmins and Chhetris are the so-called high caste people from the hills and the Newars are the indigenous aboriginal people from Kathmandu Valley.

6. Although government policies such as the "Land-Reform Programme," and the "Forestry Policy," did not completely fail, the rich and advantaged groups benefited from those programmes rather than the intended disadvantaged groups (Gaige, 1975; Bajracharya, 1983; Ghimire, 1992).

7. Until then the Terai had only access to and trade with India (Weiner, 1973).

8. The total in-migrants in urban areas of Nepal in 1991 were 292,001 (Central Bureau of Statistics, 1995).

9. The main items that came into Nepal were salt, wool, and animals whereas food grains and other items were exported to Tibet (Bishop, 1990).

10. Magars and Gurungs are the hill ethnic groups, who are also famous as Gurkha soldiers.

11. Although the hill areas are not densely populated per square mile, they are densely populated per unit of arable land (Weiner, 1973). Population density per square kilometre of cultivated land was estimated by the government of Nepal as 509 in 1980 (Shrestha, 1982).

12. When population pressure was not a problem and people's aspirations were not high, Nepalese highland rural people were self-sufficient. In many parts of Nepal, there were plenty of traditional cottage industries including bamboo crafts, mat weaving, and producing iron, brass, bronze and copper utensils. Until 1940, copper mining was one of the sources of employment in rural areas (Tiwari, 1996). Opportunities in such traditional business started to decline due to lack of market. Besides, trade between Nepal and Tibet ended in 1959 after China invaded Tibet. People involved in such businesses and trade had no choice but to migrate to better places.

13. Occupation 'service' at that time includes all kinds of administrative, technical, and academic employment in Nepal.

14. Since natural increase accounts for the change of population size, some of these people might have died during the ten-year period. Moreover, some may have emigrated to other countries as well.

15. Again, mortality and international migration have to be considered while interpreting this result. Emigration has more significant effect while analysing hill population. The hill people still migrate to Hong Kong, Singapore, Brunei, India etc. (recently, to Japan and Middle-East countries as well), for military and other employment purposes.

16. However, the total net gain may not be due to internal migration only. People who immigrate from India are also confounded with it. Because of the 'Open Border Policy' of Nepal and India, it is often difficult to determine the number of people coming in and going out of the country.

17. In a sociological context, when one member of a family migrates there is a very high probability that some of his relatives will also move subsequently to the same destination (Caldwell, 1969).

18. Some men in extended families live with parents and/or elder brothers' families and, thus get married without bothering to find a job. Such situations are not favourable to most families, however.

19. It is believed that fertility assimilation usually takes place gradually. Hervitz (1986) suggests that "there is considerable evidence that significant fertility reduction for some migrant classes takes at least one generation of time in the city" (as cited in Trovato, 1987: 267). Trovato's study (1987) found that the average fertility of rural to urban migrants in age group 15-34 to be the highest among other categories of migrants such as "urban to urban," "rural to rural," and "urban to rural." However, the differential in means among the rural-urban and rural-rural migrants was very small. The older (aged 35 and over) rural to urban migrant women also showed the highest fertility mean.

20. While responding to the population pressure, along with moving in the lowlands where opportunities are plenty, people may change their attitude towards fertility. This relationship, perhaps, explains the stubborn total fertility of Nepal coming down from 6 to 4.6 in 1996, then to 4.1 in 2001 (Ministry of Health, Nepal, 2002).

21. Political movement of a country also plays a big role in such type of migration. The recent Maoist movement and the killings in the rural areas are driving people away to cities, especially to the Kathmandu Valley. People are even emigrating to India for the same reason.

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Chapter IX

Conclusion

This study examines aspects of the interrelationship among modernization, demography, and epidemiology in reference to Nepal. The effects of various socio-economic modernization factors, including urban/rural residence, education, occupation, and female autonomy are investigated in the context of various health and demographic behaviours (age at marriage, age at first birth, parity, access to pre- and postnatal care). Further analysis focuses on fertility preference, infant mortality, maternal mortality, and internal migration.

The macro data and analysis show a clear image of the link between modernization factors and aspects of demography and epidemiology. The analysis based on macro data also suggests that Nepal is just beginning to enter the third stage of demographic transition. As in many European countries in the nineteenth and the twentieth centuries, the demographic transition in Nepal began with sustained declines in mortality, with fertility remaining virtually unchanged until the early 1990s. Similarly, Nepal is heading towards the third stage of the epidemiological transition, "The Age of Degenerative and Man-Made Diseases." Both transitions are taking place at a faster pace in the urban areas of the country. Lags in development and low status of women have slowed the demographic and epidemiological transitions.

Looking in detail at some of the demographic behaviours, it is found that Nepalese women wait an average of four years between marriage and the first child; subsequent births are spaced by an average interval of almost three years. Post-secondary educated women and women involved in business and cottage industry tend to share a preference for small family. Young women also prefer small families as compared to older cohorts. However, preference for sons over daughters is found to be a strong norm in Nepal, particularly among certain ethnic groups. Fertility behaviours are strongly conditioned by urban/rural residence and occupation of husband. These findings suggest that further fertility declines in Nepal can be engendered by increasing women's education and greater access to jobs outside agriculture. In addition, it would be important for more men to get steady salaried jobs.

Demographic and epidemiological behaviours in Nepal are also conditioned by ethnicity. Social norms mould women's autonomy and fertility preferences. Women who belong to the Tibeto-Burman linguistic groups are more autonomous and also desire small families as compared to Indo-Aryan language groups. Nepalese Muslim women (who belong to the Indo-Aryan language groups) tend to desire large families. Muslim men are dominating figures at home and generally disapprove of family planning. They want as many children as possible for such norms as "having many children is 'manly' and prestigious." These ethnic differences discussed above, to the extent that they persist, will tend to slow down Nepal's progress through demographic transition.

The hierarchical caste system of Nepal also influences the fertility of Nepalese women. The social status of the untouchable and the unclean castes is very low in Nepalese society. Normally, their dwellings are secluded from the rest of other societies. Women from such background are rarely educated, which may be one of the reasons for their preference for large families. Socially deprived women also tend to lack knowledge of family planning and contraceptives because of lack of communications with other communities. The status of women is closely linked to their autonomy (however, for the socially low status women among the Newars who paradoxically have greater autonomy in terms of speech and position in the family, than those of the high-caste Newars), which is a crucial factor in fertility.

Concerning infant mortality in Nepal, the key determinants are women's parity, place of residence, ethnicity, and immunization status of infants. Infant survival improves with urban residence, small family size, and with immunization. Infants from Newar ethnic groups share better survival chances as compared to Brahmin and Chhetri infants. This difference is likely a function of ethnic differences in prenatal and postnatal care practices. Further reduction in infant mortality in Nepal will be attained through increased education of mothers, access to employment for mothers in jobs other than agriculture, encouraging women with infants to work in home based work such as cottage industries and family business; greater levels of employment of fathers in administrative and technical fields; raising the age at marriage for women; ensuring that child delivery occur at health centre instead of at home, and providing delivery assistance by both doctor and nurse/midwife. Buddhist families show a higher probability of infant survival as compared to Hindu families. Further in-depth research on the relationship between religion and infant mortality in Nepal is needed.

One problem uncovered from this study is that women who sought pre-natal care of medical personnel, had a higher chance of experiencing the death of their infants. This finding may be unique to Nepal. It is commonly believed in Nepal that pregnancy, as a natural and normal process, does not require any medical attention unless there are serious complications. Thus, it may be that women seek medical attention only when such complications occur during pregnancy. This again attests to the role of culture in explaining Nepal's epidemiological patterns.

The findings in this thesis regarding maternal mortality indicate that many Nepalese women are dying during the postpartum period, with the number one cause of death being haemorrhage. If deaths in the postpartum period are the result of lingering complications during pregnancy, then access to prenatal care is crucial for women. Since haemorrhage is linked to anaemia, iron rich food is a necessity during pregnancy. Also, young women have greater chance of dying as compared to the old. Another strategy that would help to reduce death rates among Nepalese women would be to delay marriage. Women who marry later would bear children later in life as opposed to during the late teens, when the chances of complications are greatest.

Beyond this, many lives would be saved by ensuring that pregnant women seek proper medical help as soon as any sign of complications is seen. As found by a recent survey (Ministry of Health, 1998), three delays "deciding to seek help, reaching health centres, and providing care by health personnel at health centres" are the major causes of maternal mortality in Nepal. On the other hand, complications would also be reduced significantly if women had sufficient pre-natal and post-natal care.

Internal migration intensifies as a country undergoes socio-economic modernization. Correspondingly, there has been massive highland to lowland migration in Nepal over the past two decades. The distribution of the population has been affected by migration. In the hills where jobs are scarce, there is a declining proportion of young people, as many of them move out to the Terai and the more prosperous Kathmandu Valley. The highland to lowland migration is motivated by lack of opportunities and population pressure in the hills. The greater tendency for the young to move to the lowlands has adverse demographic, ecological, and political outcomes to both the areas of origin as well as destination. From demographic view, the in-migration of young populations also means high fertility and thus, rapid population increase in the destination areas, especially in the Terai, whereas majority of highland population will consist of frail and elderly population. The absence of able-bodied population may mean less effort on environment and agriculture-related activities such as protection of forests, crop rotation, adequate irrigation, horticultural productions, and animal husbandry. Thus, the adverse ecological effect will most likely be experienced by the highlanders. This contributes to a slowdown in rural development. On the political side, conflict between the ideologies of young hill migrants and the Terai origin people may jeopardise the general situation of the destination area, resulting in strikes and political tension. For the sake of ensuring a more balanced pattern of development in Nepal, especially the rural areas, decentralisation of economic development must occur, to allow the rural young greater access to education, job opportunities, and health care, and thus, help reduce the necessity for out-migration to the lowlands.

All of the above findings demonstrate how socio-economic, material, cultural, demographic, and health-related factors are linked to fertility, mortality, morbidity, and internal migration in Nepal.

Despite the economic hardships, difficult geographic location (landlocked in between two powerful giant nations, India and China) and geographic barriers, inadequate health facilities, infant mortality in Nepal is improving (currently at 64.1 per 1000 live-births); its life expectancy is increasing slowly, reaching 59.7 in 2001. Fertility has been declining since 1991 (total fertility at 4.1 in 2001). In the urban areas, the fertility decline has been quite remarkable. Women in Kathmandu tend to express less traditional views about family size (for example, working women preferring one child and a reduced preference for sons). Rural parents these days are also beginning to perceive large families as a problem because the average size of landholding has become small as families grow larger (land is distributed equally among the sons) (Kipp, 1995; Fricke, 1997). The decline in fertility is encouraging, as the annual growth rate of the population remains quite high (2.2 % in 2001) (Central Bureau of Statistics, 2002). Surveys show that the average "number of children ever born" is now below the "ideal number of children wanted."

The causes of death distribution for 2001 confirm that "infectious diseases" is still the number one cause of death in Nepal, with respiratory diseases taking more lives than diarrhoea/cholera cause. Older people are particularly vulnerable to the respiratory causes, while children succumb more to the latter ailments. At the same time, it is also noteworthy that the degenerative and man-made diseases are on the rise, with cancer ranked 4th, accident as 6th, heart diseases as 7th, and suicide as 8th causes of deaths. These man-made and degenerative diseases were not rampant in the past.

As revealed by this study, there are still many areas where Nepal needs to improve in order to attain higher demographic and epidemiological goals: better health care facilities well-equipped with drugs and emergency equipment, cultural training of health personnel along with their medical training, ensuring greater access to health centres for the population, as well as strengthening preventive health programmes, family planning, and prenatal programmes (including prenatal classes for both men and women).

Mortality needs to be reduced to the lowest possible level. Efforts to reduce fertility, possibly, to 2 children per woman, need to be enhanced. As urban mortality and fertility are already relatively low, the programme implementation for such reduction must be directed more on the rural population. To ensure reduction in the number of children desired by couples, it will be equally important that children survive to adulthood. Child survival programmes need to be strengthened. As well, further major declines in infant and child mortality, nationwide immunization, nutrition, sanitation, and awareness programmes must be given high priority. In achieving these goals, women's education and autonomy play important roles. A recent study in rural Nepal found that a woman's proximity to a school during childhood and even just living (currently) near a school increases permanent contraception (Axinn and Barber, 2001).

The important questions are how soon and how efficiently the government and the local people, especially in the rural areas, can help collectively to achieve such goals. Efficient and well-planned rural development programmes would seem to be a step in the right direction. Along with child and mother's survival to a desired level, internal migration may also be expected to reduce, through such programmes. For instance, if there are plenty of attractions and chances to improve living standards in the hill areas, people will be less inclined to migrate to the lowlands. Unfortunately, the rural well-off population seems to have benefited more from development programmes in Nepal rather than the rural poor. Perhaps, this is yet another challenge - how to promote more equitable distribution of opportunities in the population.

Cultural differences and hierarchical disparity are preventing rural people, especially women, to utilise the available health care facilities. Educating the urban health personnel to change their attitudes towards women, low-castes, and rural people could help change this tendency. Cultural traditions could be modified to make them compatible to current situation. For example, modification of the *tilak* tradition of the Terai, in which money and material goods must compulsorily be given to the groom, is needed. Specifying an affordable amount of money and materials as *tilak* would minimise the early marriage of girls in the Terai because parents, then, need not fear for high *tilak* demand as their daughters grow old (*tilak* demand from the groom side may go higher as the age of bride increases, as well as with the higher level of education of the groom).

In spite of all the problems in the area of health, rural development, and low status and autonomy of women, Nepal's mortality is improving steadily and fertility has finally started to decline slowly. There is no doubt that the urban areas have significant contribution to this improvement. However, there may be other reasons behind it. First, as observed during three decades from the 1960s to the 1990s, people's general living standards have improved. This is happening despite many people living below the poverty line by international standards and despite rich getting richer and poor, poorer.

Second, although there are girls who do not get chance to attend school, majority of people acknowledge the value of education. Third, women in general, seek income-generating activities to become economically independent and to support their children's education and health. Fourth, migration from rural to urban areas may also have played a big role in such improvement as a result of interaction with different media, assimilation to urban societies where transitions had occurred much earlier, and availability of modern facilities. Diffusion of ideas and awareness from urban to rural population through visiting relatives may have important roles too. Fifth, the continuing endeavours of the international non-governmental organisations (INGOs) and of the increasing number of national non-governmental organisations (NGOs) (the number of NGOs affiliated with the Social Welfare Council of Nepal have reached 14,678 as of April 23, 2003)[1] and individuals in all areas of development in Nepal are also worth mentioning. Sixth and the most important reason could be the change in attitude and behaviour of people in terms of family size, education, and autonomy to women. Women themselves are opening up these days by establishing and actively participating in credit associations, voluntary associations, cultural and sports associations, and so on (Barber et al., 2001). As women began to be aware and active, the use of modern contraceptives also started to rise steadily from 2.9 percent in 1976 reaching 38.9 percent in 2001 (Ministry of Health, 2002).

As Nepal moves closer toward attaining completion of the demographic and epidemiological transitions, a number of questions arise about its future. When people start to live longer with higher life expectancy, what would be the quality of their life? Given the background and the economic condition of the country, is it going to be even worse than the current living condition? Would the country be able to handle the aging population? Since Nepal does not have any subsidy or welfare programmes (except for pension given to ex-salaried-job holders), health insurance policy, and elderly care residences, what would happen to the growing elderly? Also, with less money to spend on treating chronic and degenerative diseases, how will the population cope with the anticipated rise of such conditions? These are only a few issues policy planners must consider to ease probable problems in the future.

Strategies for development programmes that are best suitable for specific rural areas and that are planned with joint efforts of the local people and the government will definitely be fruitful to the rural population of Nepal. Lack of communication between the planners and the villagers, and the planners' lack of knowledge on rural settings and problems are noted by social scientists (Justice, 1986). Similarly, Nepalese planners developing strategies in Kathmandu and in the case of foreign aid programmes, donor agencies planning their strategies in Washington, New York or Geneva, have been criticized by researchers (Justice, 1986). Because of the lack of communication and research, health-related, social, and demographic problems of remote areas are often not identified. Thus, the severity of such problems is not known to policy planners.

On the other hand, the contributions of the successively elected politicians in the local bodies as well as in the parliament, to rural development have remained dismal. The development efforts of most of the donor agencies have been, mostly urban centred, with limited impact in the rural areas. The rural population needs to work towards drawing immediate attention of their local representatives to get actively involved in the development of their villages. The uncontrollable internal migration and its consequences also suggest that the overall development of the country may become next to impossible if people choose to work and live in specific areas only. Such migrations could be controlled only if the government speeds up its decentralisation policy with more incentives to rural areas. The efforts of the government of Nepal, numerous non-governmental organisations (NGOs), and the international non-governmental organisations (INGOs) have been continuing in rural development in the country. The problem is: most often, such organisations are urban based. Furthermore, the scarce funding meant for health care has been spent on lavish seminars in the capital (such seminars are being organised on HIV/AIDS issues recently) (Thinley, 2002) rather than on the problems of remote areas where the money is most needed and where people are suffering and dying due to lack of even basic health care.

Most of all, it is not clear whether the findings of such research is drawing the attention of Nepalese policy planners. Indeed, the under-utilisation of healthcare facilities, under-supply of medical equipment and drugs, and the absence of health personnel from health centres have remained unresolved in the late 1990s (Sigdel, 1998) as was in the early 1980s (Justice, 1986). The suggestion derived from this study is that drawing policy planners' attention to such crucial issues is extremely important, as it is also essential to follow up on programme implications. For a successful health, demographic, and epidemiological outcome, the continuity of programmes especially those designed for rural areas, is essential.

This thesis has shown that many modernization factors are linked (directly and indirectly) to demographic and epidemiological changes, such as shifts in fertility, mortality, migration, life expectancy, and the age distribution of diseases. To summarise, the slow demographic and epidemiological transitions in Nepal seem to be the outcome of a number of factors: poor socio-economic conditions, inefficiency in health programme implementation, slow rural development, large disparity among hierarchical castes and social classes, and women's low status (both in terms of socio-economic and familial) and autonomy. Migration of people from the highland to the lowland is also playing an important role in these developments. A combined endeavour among health experts, social scientists, policy planners, and the local rural people is needed to further develop the modernization process of Nepal. Improvement in Nepal's demographic, social, and health-related conditions will help the country move further into the demographic and epidemiological transitions.

Endnote

1. This information was gathered through personal contact with the Social Welfare Coordinator, Kathmandu on April 23, 2003. The number of NGOs was 11,036 in July 2000 (see Pokharel, 2001).

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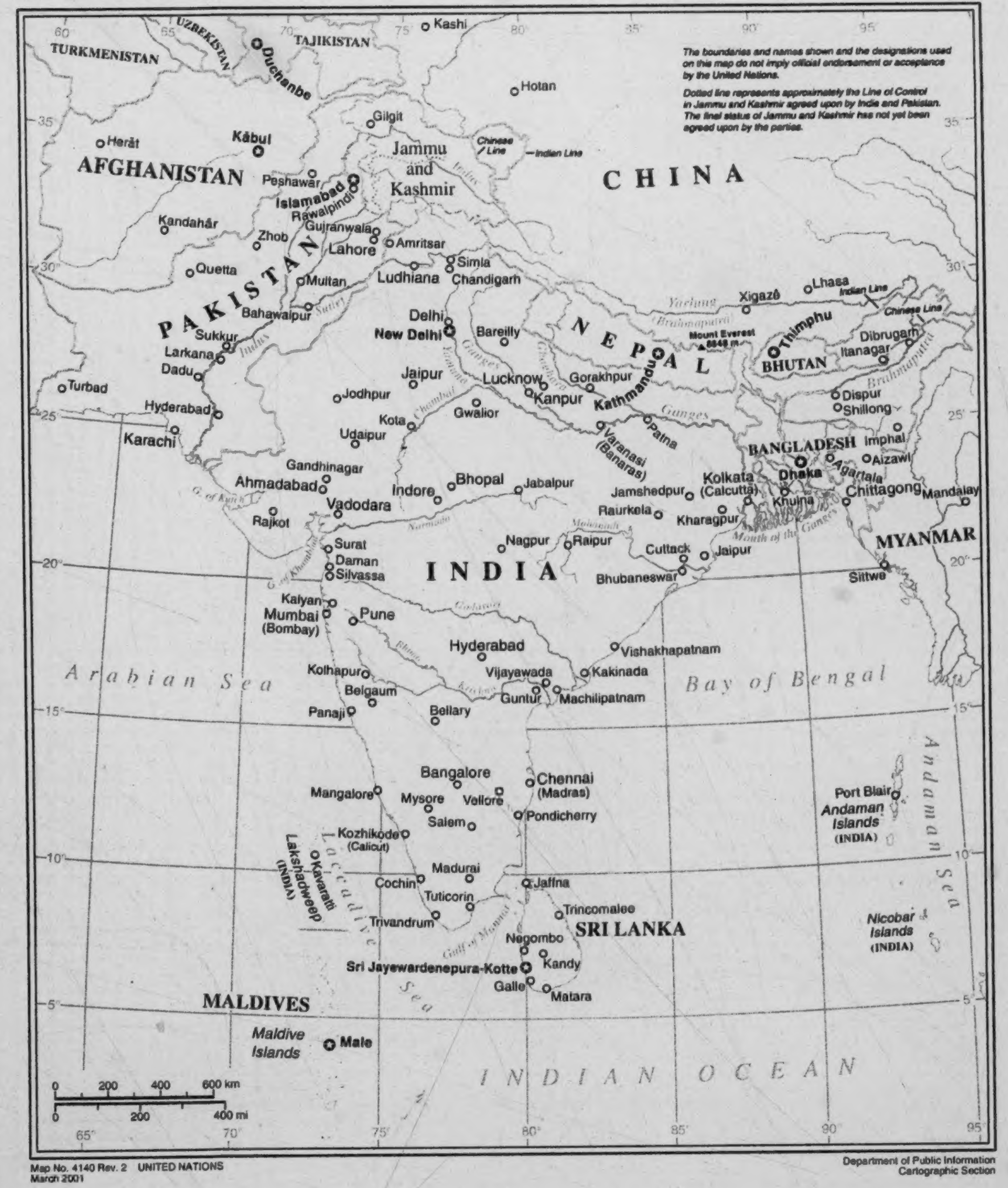
SOUTH ASIA



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Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

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